4. Stability of the ICRF source positions

M. Eubanks, U.S. Naval Observatory

An indication of the stability of the International Celestial Reference Frame (ICRF) source positions can be obtained from "arc" source position fits, in which a separate source position is estimated for each Very Long Baseline Interferometry (VLBI) observing session with observations of the source. This section provides arc source results for 379 source in the ICRF. Because of software limitations, it was not possible to obtain these estimates from one solution to the ICRF VLBI data. Instead the total ICRF source list was divided into six subsets in a quasi-random fashion (by sorting on the last digit of the IERS name), and a series of six solutions was performed, each similar to the grand ICRF solution except for the sources used to derive arc position estimates. The total set of arc position estimates from the six solutions therefore provided data from each ICRF source. Further details of the solution methodology can be obtained from Part II of this Technical Note.

In the arc solutions, the remaining sources, with only one global position estimated, form a fixed reference frame, making it possible to evaluate the repeatability of the source position estimates for each arc source. Extensive numerical tests involving different sets of arc sources show that this method does reliably reproduce changes in source position due to source structure. Because many sources were held fixed in each solution, these arc estimates are not, however, suitable for investigating global sky deformations. More rigorous estimates for the apparent motion of these sources were obtained from proper motion solutions using the original VLBI data. The simultaneous solution for apparent proper motions of all ICRF sources shows that there is a net rotation rate of about 10 micro arc seconds per year between the ICRF and a no-net rotation frame defined by averaging over all of the source proper motions. These small residual rotations were not removed from the results presented in this Part.

The quality of the arc position estimates varied widely. In certain experiments, some sources only had one successful observation, which can easily lead to position formal errors at the arc second level, while other arc position estimates can be based on hundreds of observations with positional formal errors below 0.1 mas. As the observed variations in source position due to structure changes are generally well below the level of one mas, and never much larger than a few mas, only the better arc position estimates are useful in characterizing such changes in source position. In Figure III.4, we present time series plots for each ICRF source where there are at least two or more arc position estimates, each with positional formal errors < 1 mas in both Right Ascension and Declination, there being 379 ICRF sources that fulfilled these criteria. In Table III.4, summary statistics for the scatter of the plotted residuals are provided. In both the Figure and the Table, the Right Ascension residuals are scaled by the cosine of the declination to provide true arc lengths on the sky. The complete set of ICRF arc position estimates, including those not of sufficient quality to be displayed here, are available over the World Wide Web as described in page v of this Technical Note.

Table III.4 Summary information on ICRF Sources.

This table contains, for each source in Figure III.4, the name, the range of dates of observations used, the red-shift (Z), the number of arc estimates used, the weighted rms, unweighted rms and χ^2 per degree of freedom for the residuals in both R.A. and Declination, and the total χ^2 per degree of freedom for both components together, including the correlation between R.A. and Declination. The R.A. residuals were multiplied by the cosine of the declination to provide true arc lengths on the sky.

IAU NAME ALT NAME	FIRST OBS	LAST OBS	Z	NUM EXP	α cos δ WRMS mas	α cos δ RMS mas	α cos δ χ^2/df	δ WRMS mas	δ RMS MAS	δ χ^2/df	TOTAL χ^2/df
0003+380	1992.269	1994.552	.229	2	.576	1.17	3.48	.096	.13	.09	1.8
0003-066	1988.041	1994.398	.347	2	.518	.72	1.85	.575	1.02	1.84	1.8
0007+171	1990.107	1994.612	1.601	3	.474	.64	1.10	.375	.48	.33	.7
0008-264	1994.123	1995.198	1.093	2	.339	.54	.71	.152	.22	.33	.5
0010+405	1993.305	1995.279	.256	3	.125	.32	.27	.118	.22	.18	.2
0013-005	1993.302	1993.538	1.574	2	.131	.20	.28	.097	.12	.05	.2
0014+813	1988.339	1995.581	3.384	76	.252	.37	.90	.277	.38	1.06	1.0
0016+731	1988.012	1995.089	1.781	375	.234	.38	.94	.237	.36	.95	.9
0039+230	1991.194	1994.494		3	.062	.08	.03	.295	.53	.44	.2
0047-579	1992.096	1993.074	1.797	4	.425	.86	1.64	1.033	1.23	3.33	2.5
0048-097	1987.121	1995.562		206	.333	.48	1.49	.447	.66	1.58	1.5
0059+581	1992.269	1995.565		232	.210	.37	1.06	.238	.54	1.26	1.2
0104-408	1992.276	1995.562	.584	23	.464	.84	2.05	.461	.50	1.26	1.7
0106+013	1981.886	1995.162	2.107	231	.507	.58	1.78	.723	.93	1.32	1.5
0108+388	1993.305	1995.279	.669	3	.939	1.59	11.65	.413	.54	2.29	7.0
0109+224	1991.486	1995.050		5	.424	.79	.95	.903	1.10	1.75	1.4
0112-017	1989.212	1991.194	1.365	2	.595	1.15	2.26	.208	.40	.31	1.3
0119+115	1990.116	1993.094	.570	5	.379	.46	.95	.561	.66	.69	.8
0119+041	1989.212	1995.562	.637	671	.348	.47	1.25	.436	.62	1.22	1.2
0123+257	1991.194	1994.839	2.358	4	.312	.34	.66	.379	.68	.53	.6
0131-522	1992.665	1993.937	.020	2	.237	.38	.81	1.286	1.83	6.15	3.5
0133+476	1988.972	1995.089	.859	111	.364	.58	1.04	.335	.45	.68	.9
0135-247	1989.434	1995.198	.831	2	.059	.08	.01	.043	.07	.02	.0
0146+056	1990.533	1993.094	2.345	2	.159	.22	.23	.062	.09	.01	.1
0148+274	1991.194	1994.839	1.260	5	.462	.55	1.10	.281	.30	.39	.7

Table III.4 (cont.) Summary information on ICRF Sources.

IAU NAME	ALT NAME	FIRST OBS	LAST OBS	z	NUM EXP	α cos δ WRMS mas	α cos δ RMS mas	α cos δ χ^2/df	δ WRMS mas	δ RMS MAS	δ χ^2/df	TOTAL χ^2/df
0149+218		1987.497	1993.538	1.320	10	.600	.84	1.22	1.008	1.16	2.58	1.9
0153+744		1988.127	1995.279	2.338	7	.430	.75	.76	.692	1.07	3.58	2.2
0159+723		1988.309	1994.861		14	.362	.49	.52	.523	.67	1.27	.9
0201+113		1990.658	1995.565	3.560	39	.297	.36	.75	.509	.62	1.09	.9
0202+149		1987.494	1995.565	.833	139	.297	.43	.99	.351	.56	1.03	1.0
0202-172		1989.434	1995.198	1.740	5	.315	.38	.44	.562	.97	1.44	.9
0202+319		1987.494	1995.050	1.466	13	.350	.53	.73	.583	.63	.97	.8
0208-512		1990.393	1995.562	1.001	75	.416	.63	1.49	.556	.69	1.48	1.5
0212+735		1981.886	1995.581	2.367	1031	.271	.38	.93	.283	.38	1.08	1.0
0215+015		1991.194	1994.532	1.715	5	.117	.14	.12	.325	.49	.56	.3
0219+428		1992.077	1994.552	.444	5	.706	.78	3.66	.494	.61	1.21	2.4
0220-349		1994.123	1995.488	1.490	3	.206	.31	.49	.341	.42	.78	.6
0224+671	4C67.05	1979.592	1994.676		23	.380	.40	.83	.511	.70	.99	.9
0230-790		1992.347	1995.485	1.070	5	.627	.76	1.52	.518	.61	.96	1.2
0229+131		1982.962	1995.562	2.065	951	.316	.38	1.19	.412	.63	1.13	1.2
0234+285		1980.567	1995.510	1.207	608	.235	.33	.90	.357	.50	1.25	1.1
0235+164		1980.570	1995.089	.940	78	.332	.42	.98	.413	.63	1.08	1.0
0237+040		1992.514	1993.302	.978	2	.082	.12	.08	.215	.39	.21	.1
0237-233		1994.123	1994.517	2.228	2	1.999	4.38	64.29	1.405	1.79	15.53	39.9
0238-084	NGC1052	1994.354	1995.562	.005	20	.376	.49	1.03	.514	.53	1.31	1.2
0248+430		1990.107	1994.922	1.316	10	.348	.43	.86	.376	.45	.60	.7
0252-549		1992.347	1993.937	.537	2	.135	.20	.21	.513	.73	.71	.5
0300+470		1982.956	1995.050		571	.264	.38	.91	.318	.41	1.11	1.0
0302-623		1992.096	1995.491		12	.359	.46	.92	.260	.30	.45	.7
0302+625		1992.220	1995.488		12	.531	.65	1.24	.488	.59	.89	1.1
0306+102		1993.730	1994.861	.863	2	.247	.50	.82	.196	.32	.20	.5
0308-611		1991.888	1995.491		47	.341	.40	1.09	.467	.57	1.37	1.2
0309+411		1988.471	1995.357	.136	12	.346	.62	.68	.476	.52	.59	.6
0316+413	3C84	1979.592	1994.449	.017	24	1.020	1.63	7.18	1.614	1.87	10.01	8.6
0319+121		1988.127	1995.198	2.670	7	.533	.57	2.67	.398	.49	.69	1.7

Table III.4 (cont.) Summary information on ICRF Sources.

IAU NAME	ALT NAME	FIRST OBS	LAST OBS	Z	NUM EXP	α cos δ WRMS mas	α cos δ RMS mas	α cos δ χ^2/df	δ WRMS mas	δ RMS MAS	δ χ^2/df	TOTAL χ^2/df
0326+277	0326+278	1990.061	1994.935	1.533	3	1.001	1.60	4.44	.338	.53	.33	2.4
0332-403		1989.309	1995.198	1.445	4	.570	.72	.88	.369	.51	.53	.7
0333+321	NRAO140	1988.012	1994.612	1.258	31	.509	.62	1.47	.490	.55	.89	1.2
0336-019	CTA26	1987.494	1995.565	.852	196	.300	.42	1.31	.354	.56	1.16	1.2
0338-214		1988.027	1994.123	.048	2	.641	1.77	4.45	.235	.30	1.00	2.7
0342+147		1990.828	1993.727		6	.399	.48	.86	.548	.65	.93	.9
0355+508	NRAO150	1979.592	1993.919		54	.445	.60	1.25	.569	.66	1.62	1.4
0400-319		1994.123	1994.354	1.288	2	.669	1.01	3.32	.254	.41	.63	2.0
0400+258		1988.127	1995.279	2.109	7	.250	.37	.45	.497	.66	1.16	.8
0402-362		1992.201	1995.562	1.417	15	.612	1.30	2.92	.869	1.24	3.49	3.2
0403-132		1988.041	1994.815	.571	2	.119	.45	.26	.231	.54	1.12	.7
0406+121		1987.497	1993.516		3	.425	.60	.77	.770	.97	1.24	1.0
0414-189		1988.027	1995.524	1.536	3	.376	.46	.81	.101	.15	.08	.4
0420-014		1984.664	1995.198	.915	696	.398	.45	1.80	.545	.76	1.39	1.6
0420+417		1989.113	1994.935		10	.645	.88	1.55	.426	.50	.62	1.1
0426-380		1989.309	1994.929	1.030	3	.404	.65	.71	.264	.32	.33	.5
0430+052	3C120	1987.494	1994.517	.033	4	.984	1.57	11.61	.215	.34	.25	5.9
0434-188		1988.027	1995.488	2.702	17	.332	.45	.62	.820	.73	2.91	1.8
0437-454		1995.488	1995.491		2	.160	.23	.68	.457	.65	1.06	.9
0438-436		1993.625	1995.491	2.852	6	.261	.51	.69	.731	.96	1.41	1.0
0440+345		1994.398	1995.412		3	.353	.87	4.11	.126	.20	.39	2.3
0446+112		1994.552	1995.373		2	.186	.25	.35	.648	1.45	3.03	1.7
0454-810		1991.359	1995.485	.444	9	.425	.59	1.63	.372	.45	1.32	1.5
0454-234		1986.053	1995.562	1.009	318	.390	.51	1.26	.533	.75	1.53	1.4
0457+024		1993.305	1995.437	2.384	9	.405	.51	1.29	.381	.57	.79	1.0
0458-020		1990.697	1995.562	2.286	392	.268	.37	1.09	.320	.45	.96	1.0
0459+060		1994.935	1995.279		2	.223	.43	1.05	.590	1.28	2.21	1.6
0500+019		1992.452	1993.538	.583	2	.218	.32	.50	.603	.88	.96	.7
0502+049		1993.209	1994.861	.954	2	.251	.41	.55	1.119	1.61	2.81	1.7
0506-612		1991.359	1994.497	1.093	6	.347	.42	.77	.842	1.05	4.13	2.4

Table III.4 (cont.) Summary information on ICRF Sources.

IAU NAME	ALT NAME	FIRST OBS	LAST OBS	z	NUM EXP	α cos δ WRMS mas	α cos δ RMS mas	α cos δ χ^2/df	δ WRMS mas	δ RMS MAS	δ χ^2/df	TOTAL χ^2/df
0454+844		1989.642	1994.708	.112	31	.290	.35	.67	.307	.42	.65	.7
0507+179		1990.828	1995.279		6	.256	.37	.64	.372	.68	.74	.7
0516-621		1992.369	1995.562		7	.401	.71	1.65	.454	.48	1.03	1.3
0530-727		1991.962	1995.491		9	.492	.58	.98	.538	.73	.77	.9
0528-250		1989.309	1994.200	2.765	4	.616	.98	1.78	.674	1.24	3.54	2.7
0528+134		1981.886	1995.565	2.070	1197	.311	.38	1.20	.419	.66	1.25	1.2
0537-441		1990.395	1995.542	.894	74	.442	.62	1.57	.596	.78	1.67	1.6
0537-286		1991.886	1993.779	3.119	3	1.231	1.47	3.18	.513	.60	.79	2.0
0539-057		1993.768	1995.279	.839	3	.386	.53	2.74	.348	.46	.82	1.8
0538+498	3C147	1992.452	1994.494	.545	3	.385	.57	.70	.156	.27	.11	.4
0552+398		1979.902	1995.581	2.365	1736	.238	.33	1.00	.280	.43	1.05	1.0
0605-085		1987.121	1994.603	.870	2	.046	.08	.03	.057	.08	.04	.0
0607-157		1994.123	1995.198	.324	2	.045	.06	.04	.070	.10	.16	.1
0609+607		1987.589	1994.398	2.690	13	.495	.62	.93	.752	.81	1.86	1.4
0620+389		1994.105	1994.922	3.470	4	.364	.78	1.69	.377	.62	1.23	1.5
0615+820		1989.113	1994.968	.710	18	.322	.45	.67	.401	.63	.95	.8
0637-752		1990.393	1995.562	.653	108	.492	.71	2.19	.434	.66	1.49	1.8
0636+680		1991.275	1995.279	3.174	13	.315	.48	.46	.529	.72	1.19	.8
0642+449		1984.069	1995.581	3.406	67	.267	.40	1.01	.261	.38	.73	.9
0646-306		1989.434	1994.517	.455	2	.096	.19	.16	.748	1.05	3.62	1.9
0648-165		1987.217	1994.661		2	.392	.55	1.91	.429	.94	2.08	2.0
0650+371		1991.645	1995.089	1.982	12	.354	.46	1.23	.506	.57	.59	.9
0657+172		1989.592	1994.929		55	.388	.41	1.01	.562	.65	1.27	1.1
0707+476		1987.497	1995.279	1.292	8	.199	.25	.36	.546	.72	2.04	1.2
0710+439		1992.514	1994.708	.518	5	.771	.87	3.16	.294	.38	.28	1.7
0711+356		1988.127	1994.861	1.620	4	.268	.45	.45	.703	.77	1.63	1.0
0716+714		1989.362	1995.089		31	.279	.34	.43	.391	.54	.65	.5
0722+145		1992.361	1994.935		2	.236	.43	.90	.025	.04	.00	.5
0723-008		1987.121	1995.279	.127	3	.158	.33	.43	.387	.52	1.27	.9
0718+792	0718+793	1990.907	1995.562		31	.308	.47	.76	.307	.45	.92	.8

Table III.4 (cont.) Summary information on ICRF Sources.

IAU NAME	ALT NAME	FIRST OBS	LAST OBS	Z	NUM EXP	α cos δ WRMS mas	α cos δ RMS mas	α cos δ χ^2/df	δ WRMS mas	δ RMS MAS	δ χ^2/df	TOTAL χ^2/df
0727-115		1986.026	1995.562		675	.352	.46	1.55	.466	.80	1.51	1.5
0735+178		1988.471	1995.581		365	.300	.38	1.29	.311	.51	1.03	1.2
0738-674		1993.937	1995.491	1.663	5	.362	.51	1.28	.692	1.25	2.05	1.7
0738+313		1988.127	1995.357	.630	14	.409	.56	1.37	.552	.82	2.63	2.0
0742+103		1986.195	1995.279		153	.348	.39	1.13	.510	.64	1.18	1.2
0745+241		1989.592	1992.632	.409	44	.629	.78	1.43	.546	.63	.77	1.1
0748+126		1988.012	1994.839	.899	6	.436	.61	2.05	.556	1.12	2.33	2.2
0749+540		1984.206	1995.562	.200	33	.164	.30	.52	.226	.49	.88	.7
0754+100		1986.195	1995.198	.660	5	.319	.37	.72	.356	.56	.78	.7
0805-077		1988.041	1995.198	1.837	2	.077	.09	.05	.133	.20	.33	.2
0804+499		1988.012	1995.565	1.433	146	.174	.34	.66	.212	.34	.90	.8
0805+410		1992.269	1995.562	1.420	34	.167	.25	.52	.236	.38	.90	.7
0808+019		1993.538	1995.279		2	.066	.14	.17	.003	.00	.00	.1
0812+367		1988.471	1994.552	1.025	4	.450	.57	1.05	.524	.59	.94	1.0
0814+425		1984.069	1994.922	.258	74	.488	.70	1.16	.518	.58	1.20	1.2
0818-128		1988.958	1995.412		3	.405	.43	.83	.482	.69	1.93	1.4
0820+560		1987.497	1995.357	1.417	44	.358	.49	2.39	.206	.32	.92	1.7
0821+394		1990.828	1994.612	1.216	9	.640	1.00	1.70	.716	.98	1.51	1.6
0823+033		1988.217	1995.562	.506	236	.270	.41	1.17	.352	.54	1.25	1.2
0826-373		1994.469	1995.491		4	.340	.68	1.10	.844	1.06	2.43	1.8
0827+243		1988.339	1994.708	2.046	6	.338	.50	.75	.644	.68	1.42	1.1
0829+046		1993.209	1994.494	.180	3	.302	.38	.84	.440	.60	.76	.8
0828+493		1990.907	1994.398	.548	6	.404	.49	1.23	.605	.75	1.48	1.4
0834-201		1994.354	1994.815	2.756	2	.107	.24	.12	.526	.83	1.02	.6
0833+585		1987.497	1995.279	2.101	7	.464	.69	.97	.336	.65	.84	.9
0836+710		1987.497	1994.968	2.160	7	.237	.38	.64	.394	.57	1.60	1.1
0839+187		1990.357	1994.839	1.270	7	.645	.82	1.76	.738	.85	1.01	1.4
0850+581		1992.269	1994.494	1.322	3	.163	.32	.18	.357	.68	.93	.6
0851+202	OJ287	1980.281	1995.565	.306	1433	.285	.36	1.11	.383	.55	1.14	1.1
0859-140		1987.217	1994.123	1.327	2	.336	.70	1.26	.434	.74	3.23	2.2

Table III.4 (cont.) Summary information on ICRF Sources.

IAU NAME	ALT NAME	FIRST OBS	LAST OBS	Z	NUM EXP	α cos δ WRMS mas	α cos δ RMS mas	α cos δ χ^2/df	δ WRMS mas	δ RMS MAS	δ χ^2/df	TOTAL χ^2/df
0859+470		1988.320	1995.279	1.462	23	.262	.38	.46	.384	.51	.48	.5
0912+297		1993.519	1994.839		3	.535	.99	1.92	.925	1.24	2.51	2.2
0917+449		1987.497	1994.612	2.180	19	.199	.33	.39	.645	.70	1.19	.8
0919-260		1992.058	1995.491	2.300	21	.299	.37	.84	.653	.69	1.14	1.0
0917+624		1987.497	1995.279	1.446	10	.199	.27	.51	.147	.18	.25	.4
0920+390		1995.050	1995.527		11	.278	.37	.69	.329	.41	.58	.6
0923+392	4C39.25	1980.281	1995.565	.699	1578	.304	.40	1.61	.282	.42	1.03	1.3
0945+408		1990.107	1994.839	1.252	9	.234	.40	.38	.561	.85	1.67	1.0
0951+693	M81	1993.650	1995.581	.001	7	.295	.40	1.05	.196	.41	.50	.8
0953+254	OK290	1989.423	1995.562	.712	162	.349	.51	1.70	.327	.49	1.18	1.4
0955+476		1992.269	1995.565	1.873	298	.176	.26	.64	.204	.30	.72	.7
0955+326		1990.533	1994.552	.533	5	.475	.54	1.31	.730	.85	1.65	1.5
0954+658		1987.494	1995.581	.368	157	.276	.41	.97	.300	.40	.90	.9
1004+141		1988.309	1995.510	2.707	10	.290	.31	1.04	.485	.77	1.98	1.5
1012+232		1990.831	1993.727	.565	3	.587	.90	2.84	.305	.34	.38	1.6
1020+400		1988.471	1994.935	1.250	7	.651	.96	2.80	.592	.75	1.62	2.2
1021-006		1993.302	1994.922	2.547	2	.538	.94	3.16	.148	.24	.08	1.6
1022+194		1994.861	1995.279	.828	2	.091	.15	.26	.462	.88	3.22	1.7
1030+415		1988.127	1992.249	1.120	4	.737	.78	1.51	.711	.86	1.40	1.5
1032-199		1988.041	1995.198	2.198	2	1.115	1.80	4.79	.976	1.92	8.61	6.7
1034-293		1987.108	1995.562	.312	98	.465	.75	1.54	.663	1.02	2.43	2.0
1038+064		1991.771	1993.094	1.270	2	.060	.09	.04	.443	.67	.62	.3
1038+528	1038+52A	1991.828	1995.581	.678	32	.257	.37	.70	.355	.64	.89	.8
1038+529	1038+52B	1994.839	1995.453	2.296	2	.095	.15	.04	.077	.12	.02	.0
1040+123	3C245	1989.362	1995.198	1.029	5	.425	.51	.69	.319	.40	.34	.5
1039+811		1989.870	1994.935	1.260	27	.313	.36	.94	.174	.22	.30	.6
1045-188		1988.041	1994.123	.595	2	.629	1.97	4.68	.915	2.37	10.57	7.6
1044+719		1990.578	1995.581	1.150	95	.277	.47	1.15	.271	.48	1.03	1.1
1049+215		1990.107	1995.279	1.300	5	.197	.40	.63	.496	.72	2.30	1.5
1053+704		1993.420	1995.581	2.492	16	.549	.78	2.05	.409	.59	1.12	1.6

Table III.4 (cont.) Summary information on ICRF Sources.

IAU NAME	ALT NAME	FIRST OBS	LAST OBS	Z	NUM EXP	α cos δ WRMS mas	α cos δ RMS mas	α cos δ χ^2/df	δ WRMS mas	δ RMS MAS	δ χ^2/df	TOTAL χ^2/df
1053+815		1989.870	1995.357	.706	60	.361	.44	.89	.434	.55	1.37	1.1
1055+018		1986.195	1993.727	.888	89	.319	.40	1.05	.763	.91	1.58	1.3
1057-797		1990.393	1995.530		102	.358	.45	.94	.385	.63	1.15	1.0
1101-536		1991.359	1995.562		17	.303	.55	.83	.686	.77	1.84	1.3
1101+384		1994.456	1994.922	.030	2	.330	.67	1.15	.075	.15	.04	.6
1104-445		1990.491	1995.530	1.598	64	.414	.57	1.25	.622	.68	1.47	1.4
1111+149		1988.320	1992.452	.869	3	.162	.20	.15	.618	.74	.86	.5
1116+128		1988.309	1995.279	2.118	5	.382	.54	1.76	.315	.45	.56	1.2
1123+264		1987.497	1994.929	2.341	53	.487	.60	1.31	.454	.61	.96	1.1
1124-186		1987.217	1995.491	1.050	9	.570	.74	2.14	.489	.50	1.09	1.6
1127-145		1994.517	1995.198	1.187	3	.566	1.01	5.38	.413	.50	2.12	3.8
1128+385		1987.494	1995.565	1.733	150	.188	.27	.65	.276	.40	1.12	.9
1144+402		1984.069	1994.612	1.089	54	.436	.59	1.35	.605	.69	1.70	1.5
1144-379		1992.058	1995.530	1.048	15	.303	.50	.62	.403	.43	.56	.6
1145-071		1988.041	1995.277	1.345	24	.494	.67	1.36	.324	.42	.61	1.0
1147+245		1992.269	1994.494		2	.018	.02	.00	.128	.19	.13	.1
1148-671		1992.665	1993.074		2	.762	1.23	6.75	.303	.44	.71	3.7
1150+812		1987.494	1995.279	1.250	39	.263	.33	.87	.269	.39	.80	.8
1150+497		1990.107	1994.935	.334	5	.235	.28	.32	.401	.49	.81	.6
1155+251		1992.968	1993.730		2	.986	1.49	3.88	.191	.27	.13	2.0
1156+295		1987.497	1995.357	.729	159	.263	.42	.93	.326	.48	1.03	1.0
1213-172		1987.121	1995.412		3	.061	.15	.04	.247	.44	.38	.2
1213+350		1990.828	1995.279	.851	7	.587	1.00	1.78	.542	1.02	1.18	1.5
1215+303		1991.486	1994.861	.237	4	.362	.44	.86	.587	.75	.91	.9
1216+487		1987.497	1995.050	1.073	9	.242	.45	.37	.330	.41	.68	.5
1219+285		1980.567	1992.813	.102	5	.742	.82	2.09	.383	.39	.35	1.2
1219+044		1991.332	1995.565	.965	194	.234	.33	.89	.319	.48	1.01	.9
1221+809		1990.907	1995.279		7	.613	.97	2.91	.361	.70	.87	1.9
1226+373		1991.332	1995.089	1.515	5	.396	.54	1.44	.275	.36	.78	1.1
1226+023	3C273B	1981.886	1995.092	.158	228	.685	.73	3.48	.879	1.17	2.71	3.1

Table III.4 (cont.) Summary information on ICRF Sources.

IAU NAME	ALT NAME	FIRST OBS	LAST OBS	z	NUM EXP	α cos δ WRMS mas	α cos δ RMS mas	α cos δ χ^2/df	δ WRMS mas	δ RMS MAS	δ χ^2/df	TOTAL χ^2/df
1228+126	3C274	1988.263	1995.565	.004	33	.360	.49	1.22	.422	.62	1.00	1.1
1236+077		1993.302	1995.279	.400	3	.256	.43	1.08	.148	.23	.18	.6
1240+381		1994.209	1995.089	1.316	2	.900	1.42	5.48	.153	.21	.37	2.9
1244-255		1991.878	1994.929	.633	28	.416	.54	.87	.477	.58	1.04	1.0
1252+119		1992.077	1994.209	.871	6	.533	1.01	1.60	.288	.54	.39	1.0
1251-713		1991.359	1993.088		10	.339	.52	1.03	.422	.57	1.27	1.2
1253-055	3C279	1987.190	1995.450	.538	49	.605	.61	2.00	1.128	1.25	2.46	2.2
1255-316		1989.434	1995.491	1.924	4	.481	.61	.98	.711	.95	1.35	1.2
1300+580		1994.190	1995.562		14	.486	.73	2.58	.518	.82	2.55	2.6
1302-102		1988.041	1994.968	.286	4	.503	.73	1.84	.141	.20	.16	1.0
1307+121		1993.305	1995.279		2	.097	.35	.19	.218	.53	.37	.3
1308+326		1985.349	1995.565	.996	744	.250	.42	1.01	.292	.44	1.11	1.1
1313-333		1991.878	1995.491	1.210	11	.319	.59	.76	.390	.45	.51	.6
1315+346	OP326	1990.283	1994.922	1.050	4	.302	.42	1.06	1.079	1.73	3.76	2.4
1334-127		1987.121	1995.562	.539	478	.379	.45	1.65	.549	.83	1.84	1.7
1342+662		1990.357	1994.708	.776	5	.438	.66	1.25	.608	.78	2.87	2.1
1342+663		1989.213	1995.357	1.347	22	.351	.41	.65	.361	.47	.64	.6
1347+539		1990.107	1995.279	.976	8	.300	.47	.65	.354	.48	.70	.7
1349-439		1992.369	1994.929	.053	2	.321	.51	.82	.855	1.33	2.97	1.9
1351-018		1993.453	1995.562	3.709	15	.313	.43	.86	.478	.53	1.06	1.0
1354+195		1984.518	1994.968	.720	38	.584	.80	2.03	.680	.87	2.11	2.1
1354-152		1987.217	1994.968	1.890	7	.694	.78	1.91	.702	.74	2.56	2.2
1357+769		1988.309	1995.565		176	.165	.32	.61	.193	.31	.80	.7
1402+044		1993.453	1995.279	3.208	13	.359	.69	1.02	.565	.68	1.27	1.1
1404+286	OQ208	1980.281	1994.935	.077	718	.388	.49	1.47	.633	.85	1.71	1.6
1406-076		1988.041	1995.198	1.493	2	.519	.91	2.07	.222	.36	.82	1.4
1418+546		1982.461	1995.357	.152	98	.498	.59	1.13	.497	.65	1.11	1.1
1424-418		1990.393	1995.491	1.522	34	.324	.48	.81	.748	.87	1.70	1.3
1435+638		1988.339	1994.708	2.060	10	.394	.60	.80	.572	.72	1.53	1.2
1442+101	OQ172	1993.453	1994.922	3.544	4	1.107	1.49	3.59	.956	1.22	2.64	3.1

Table III.4 (cont.) Summary information on ICRF Sources.

IAU NAME	ALT NAME	FIRST OBS	LAST OBS	z	NUM EXP	α cos δ WRMS mas	α cos δ RMS mas	α cos δ χ^2/df	δ WRMS mas	δ RMS MAS	δ χ^2/df	TOTAL χ^2/df
1448+762		1988.127	1993.845	.899	3	1.118	1.46	3.08	.368	.44	.89	2.0
1451-375		1993.074	1994.815	.314	3	.264	.37	.77	.592	.69	1.83	1.3
1451-400		1994.200	1995.198	1.810	6	.405	.61	.81	.761	.83	2.72	1.8
1458+718	3C309.1	1990.828	1995.279	.905	9	.706	1.34	3.73	.714	1.50	3.42	3.6
1459+480		1989.335	1994.552		6	.463	.77	1.20	.200	.25	.14	.7
1502+106		1984.664	1994.517	1.833	305	.408	.53	1.36	.650	.80	1.35	1.4
1504+377		1987.497	1994.708	.674	10	.443	.56	1.95	.398	.73	1.08	1.5
1504-166		1987.121	1993.351	.876	4	.820	1.08	1.44	.859	1.14	2.27	1.9
1508+572		1994.516	1995.546	4.300	9	.189	.24	.54	.190	.21	.37	.5
1510-089		1987.217	1995.279	.361	91	.388	.43	1.32	.648	.73	1.32	1.3
1511-100		1987.217	1994.123	1.513	2	.401	.70	1.24	.725	1.59	6.42	3.8
1514+197		1991.486	1994.494		4	.519	.57	1.98	.363	.48	.52	1.3
1514-241		1991.665	1995.488	.049	5	.267	.60	.42	.719	.91	1.43	.9
1519-273		1987.217	1995.488		40	.431	.48	1.01	.379	.44	.65	.8
1538+149		1989.113	1995.198	.605	4	.284	.39	.34	.404	.76	.72	.5
1547+507		1987.828	1994.398	2.169	7	.427	.56	1.12	.526	.81	1.23	1.2
1546+027		1993.730	1995.279	.412	2	.134	.26	.61	.268	.61	1.11	.9
1548+056		1984.518	1994.968	1.422	150	.341	.40	1.02	.555	.73	1.52	1.3
1549-790		1991.359	1995.485	.149	10	.280	.50	1.15	.209	.26	.57	.9
1557+032		1994.661	1994.922	3.900	3	.377	.72	2.21	.451	.68	1.76	2.0
1606+106		1990.061	1995.565	1.226	418	.232	.32	.94	.303	.48	1.07	1.0
1607+268	CTD93	1994.922	1995.279	.473	2	.197	.28	.84	.880	1.25	7.17	4.0
1611+343		1981.461	1995.565	1.401	717	.223	.34	.85	.320	.42	1.10	1.0
1614+051		1991.886	1995.510	3.210	18	.348	.51	.84	.384	.62	.67	.8
1610-771		1990.393	1995.562	1.710	92	.381	.44	1.27	.453	.62	1.48	1.4
1616+063		1993.302	1993.538	2.086	2	.260	.37	.59	.242	.32	.18	.4
1619-680		1992.347	1993.074	1.354	2	.141	.22	.44	.573	.84	2.51	1.5
1622-253		1987.121	1995.562	.786	212	.454	.65	1.68	.658	.85	2.05	1.9
1624+416		1987.494	1995.453	2.550	7	.351	.48	.85	.345	.44	.73	.8
1622-297		1989.309	1994.123	.815	3	.576	.89	.99	.407	.60	.72	.9

Table III.4 (cont.) Summary information on ICRF Sources.

IAU NAME	ALT NAME	FIRST OBS	LAST OBS	z	NUM EXP	α cos δ WRMS mas	α cos δ RMS mas	α cos δ χ^2/df	δ WRMS mas	δ RMS MAS	δ χ^2/df	TOTAL χ^2/df
1633+382	1633+38	1981.461	1995.279	1.814	301	.367	.52	1.52	.411	.59	1.26	1.4
1637+574		1982.458	1994.922	.745	116	.293	.38	.88	.426	.59	1.28	1.1
1638+398	NRAO512	1990.787	1995.581	1.666	197	.199	.29	.78	.246	.42	.99	.9
1642+690		1980.281	1995.357	.751	64	.422	.59	1.05	.475	.63	1.13	1.1
1641+399	3C345	1980.281	1995.581	.594	546	.487	.55	2.46	.467	.60	1.22	1.8
1652+398	DA426	1987.494	1995.527	.034	14	.355	.49	1.39	.514	.72	1.69	1.5
1656+348		1993.730	1995.453	1.936	3	.378	.50	.44	.225	.33	.16	.3
1656+477		1993.538	1994.398	1.622	2	.602	1.00	4.13	.281	.45	.91	2.5
1655+077		1993.727	1994.839	.621	3	.220	.27	.35	.355	.44	.44	.4
1656+053		1988.471	1994.209	.879	7	.358	.46	.90	.199	.31	.21	.6
1657-261		1988.027	1994.815		9	.659	.84	1.01	.477	.79	1.02	1.0
1705+018		1993.302	1994.968	2.568	15	.512	.68	1.98	.571	.69	1.66	1.8
1717+178		1988.309	1994.861		6	.581	.81	1.57	1.209	1.52	3.67	2.6
1726+455		1992.269	1995.562	.714	107	.234	.39	.90	.217	.40	.68	.8
1725+044		1993.519	1995.279	.293	2	.152	.30	.61	.396	.79	1.67	1.1
1730-130	NRAO530	1986.026	1994.922	.902	125	.433	.53	1.64	.622	.93	1.79	1.7
1732+389		1988.339	1994.214	.976	14	.249	.37	.50	.633	.72	1.59	1.0
1738+499		1994.190	1995.089	1.545	3	.394	.49	1.90	.229	.28	.68	1.3
1738+476		1989.073	1995.357	.316	9	.354	.55	.72	.585	.59	1.39	1.1
1739+522		1988.012	1995.562	1.375	858	.216	.34	.87	.235	.35	.88	.9
1741-038		1985.647	1995.565	1.054	880	.287	.38	1.11	.407	.67	1.19	1.2
1743+173		1988.471	1995.279	1.702	5	.277	.51	1.12	.339	.64	.90	1.0
1745+624		1992.804	1995.565	3.886	56	.224	.33	.81	.292	.59	1.14	1.0
1746+470		1994.190	1995.089		3	.179	.22	.42	.271	.34	.94	.7
1749+701		1991.771	1995.565	.760	7	.539	.49	1.02	.384	.46	.55	.8
1749+096		1984.664	1995.565	.322	568	.257	.37	.96	.331	.52	1.05	1.0
1751+441		1990.107	1994.494	.871	6	.223	.32	.26	.428	.65	1.13	.7
1751+288		1988.127	1995.357		5	.447	.54	1.81	.476	.69	.96	1.4
1758+388		1994.209	1995.297	2.092	4	.117	.14	.34	.165	.23	.61	.5
1803+784		1982.461	1995.546	.680	1319	.239	.34	.90	.264	.35	1.09	1.0

Table III.4 (cont.) Summary information on ICRF Sources.

IAU NAME	ALT NAME	FIRST OBS	LAST OBS	z	NUM EXP	α cos δ WRMS mas	α cos δ RMS mas	α cos δ χ^2/df	δ WRMS mas	δ RMS MAS	δ χ^2/df	TOTAL χ^2/df
1800+440		1991.278	1994.839	.663	4	.490	.61	1.15	.325	.42	.33	.7
1758-651		1992.369	1995.491		4	.274	.40	.60	.671	.89	2.01	1.3
1807+698	3C371	1988.012	1995.450	.051	38	.307	.39	.81	.320	.40	.82	.8
1806+456		1994.190	1994.532	.830	2	.211	.31	1.07	.004	.00	.00	.5
1815-553		1990.395	1995.488		14	.933	.98	2.77	.634	.73	1.18	2.0
1817-254		1994.123	1995.316		2	.022	.03	.01	.073	.18	.06	.0
1826+796		1990.533	1994.517	.224	5	.463	.80	1.19	.407	.74	.98	1.1
1821+107		1989.642	1995.198	1.360	6	.338	.47	.94	.743	1.13	2.14	1.5
1823+568		1987.494	1995.089	.664	19	.357	.48	1.25	.384	.66	1.15	1.2
1830+285		1991.275	1994.968	.594	3	.107	.24	.14	.173	.44	.34	.2
1831-711		1992.096	1994.929	1.356	12	.207	.36	.38	.383	.59	.94	.7
1845+797	3C390.3	1989.642	1994.839	.057	9	.527	.72	1.02	.448	.54	.70	.9
1842+681		1988.012	1994.935	.475	8	.454	.53	.95	.320	.31	.53	.7
1849+670		1992.074	1995.279	.657	4	.376	.50	2.66	.190	.30	.67	1.7
1856+737	1856+736	1988.309	1994.861	.460	5	.298	.33	.38	.202	.21	.16	.3
1901+319	3C395	1991.486	1995.105	.635	11	.413	.61	1.65	.530	.93	1.89	1.8
1908-201		1992.257	1995.198		4	.223	.33	.28	.267	.34	.65	.5
1921-293		1987.108	1995.562	.352	212	.438	.64	1.90	.635	.92	2.41	2.2
1923+210		1989.362	1994.456		36	.560	.69	1.40	.541	.71	.87	1.1
1928+738		1981.458	1994.708	.302	48	.379	.53	1.21	.424	.51	1.34	1.3
1929+226		1994.494	1995.510		3	.080	.14	.11	.198	.31	.42	.3
1933-400		1992.276	1992.970	.966	4	.819	.96	1.34	.545	.64	1.24	1.3
1937-101		1994.123	1994.815	3.787	2	.200	.28	.62	.353	.50	2.70	1.7
1935-692		1991.359	1995.485	3.170	4	1.256	1.76	5.74	.744	.94	1.53	3.6
1954+513		1987.497	1995.279	1.230	29	.336	.38	1.02	.312	.44	.68	.8
1954-388		1993.074	1995.530	.630	8	.417	.51	2.52	.608	.80	1.53	2.0
1958-179		1987.217	1995.562	.650	145	.352	.49	1.04	.579	.77	1.48	1.3
2007+777		1986.195	1995.581	.342	210	.276	.38	1.30	.209	.33	.80	1.1
2005+642		1994.190	1995.220		3	.665	.91	5.84	.093	.10	.13	3.0
2017+745	2017+743	1990.088	1995.279	2.200	17	.312	.52	.66	.309	.40	.73	.7

Table III.4 (cont.) Summary information on ICRF Sources.

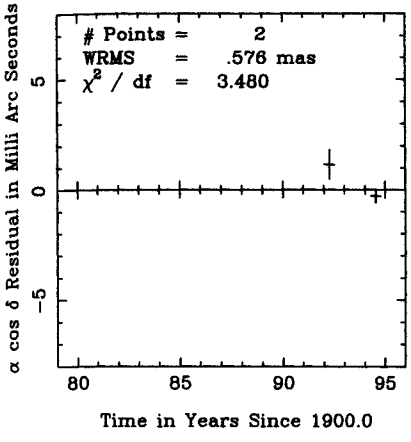
IAU NAME	ALT NAME	FIRST OBS	LAST OBS	Z	NUM EXP	α cos δ WRMS mas	α cos δ RMS mas	α cos δ χ^2/df	δ WRMS mas	δ RMS MAS	δ χ^2/df	TOTAL χ^2/df
2021+614		1988.012	1994.676	.227	19	.673	.74	3.97	.865	1.03	5.53	4.8
2021+317		1988.471	1994.708		9	.463	.77	1.90	.411	.60	.89	1.4
2030+547		1988.339	1994.839		3	.090	.13	.06	.399	.47	.51	.3
2029+121		1988.127	1995.357	1.215	8	.130	.20	.15	.590	.82	1.39	.8
2037+511	3C418	1984.069	1995.050	1.686	99	.379	.59	1.15	.420	.60	1.12	1.1
2037-253		1989.434	1994.815	1.574	2	.362	.51	.28	.461	.65	1.00	.6
2051+745		1991.977	1993.730		3	.243	.29	.23	.179	.26	.15	.2
2052-474		1992.096	1995.530	1.489	6	.345	.40	.88	.729	1.12	1.47	1.2
2059+034		1991.486	1994.494	1.013	3	.102	.12	.07	.440	.73	.63	.4
2059-786		1992.347	1993.937		2	.131	.23	.11	.388	.65	1.03	.6
2106-413		1992.096	1995.488	1.055	4	.341	.36	1.53	.318	.35	.31	.9
2113+293		1987.497	1995.279	1.514	17	.317	.58	1.05	.380	.56	.90	1.0
2109-811		1992.369	1995.491		6	.243	.26	.27	.486	.61	1.61	.9
2121+053		1986.195	1995.562	1.878	338	.498	.61	2.13	.480	.69	1.17	1.7
2126-158		1992.593	1995.198	3.270	6	.359	.47	.90	.359	.44	.47	.7
2128-123		1987.108	1995.562	.501	159	.450	.51	1.59	.765	.96	1.98	1.8
2131-021		1988.041	1993.538	1.285	4	.114	.12	.09	1.107	1.25	2.41	1.3
2134+004	2134+00	1981.461	1995.092	1.936	88	.530	.59	1.41	.927	1.09	1.67	1.5
2136+141		1987.497	1995.357	2.427	10	.410	.57	1.77	.359	.46	.79	1.3
2144+092		1987.494	1993.727	1.113	10	.365	.46	.69	.403	.53	.67	.7
2145+067		1984.518	1995.565	.990	793	.287	.42	1.18	.369	.59	1.27	1.2
2149+056		1989.362	1993.730	.740	2	.137	.17	.27	.989	1.87	5.50	2.9
2146-783		1992.347	1993.937		2	.643	.90	2.20	.222	.31	.29	1.2
2150+173		1988.127	1994.283		7	.867	.89	2.53	.461	.52	.40	1.5
2155-152		1987.108	1994.968	.672	5	1.124	1.70	5.12	1.281	1.78	5.34	5.2
2200+420	VR422201	1980.281	1995.453	.070	568	.381	.47	1.27	.531	.65	1.35	1.3
2201+315		1987.497	1995.453	.298	158	.251	.36	1.17	.350	.53	1.52	1.3
2204-540		1992.347	1993.074	1.206	2	.287	.47	1.71	.371	.67	1.06	1.4
2209+236		1990.828	1995.357		9	.696	.88	3.25	.716	1.04	1.45	2.4
2216-038		1985.371	1994.532	.901	193	.369	.41	1.14	.664	.87	1.63	1.4

Table III.4 (cont.) Summary information on ICRF Sources.

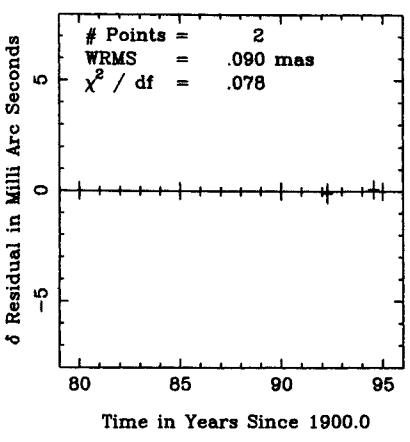
IAU NAME	ALT NAME	FIRST OBS	LAST OBS	Z	NUM EXP	α cos δ WRMS mas	α cos δ RMS mas	α cos δ χ^2/df	δ WRMS mas	δ RMS MAS	δ χ^2/df	TOTAL χ^2/df
2227-088		1987.217	1995.279	1.562	2	.109	.40	.41	.092	.23	.13	.3
2229+695		1989.213	1994.676		8	.488	.58	.79	.191	.21	.12	.5
2230+114	CTA102	1987.494	1993.516	1.037	43	.657	.76	1.42	.931	.99	1.62	1.5
2232-488		1994.497	1994.756	.510	2	.430	.68	1.18	.471	.72	.59	.9
2234+282		1984.320	1995.565	.795	866	.346	.48	1.43	.393	.53	1.30	1.4
2243-123		1987.121	1995.562	.630	41	.273	.34	.78	.570	.59	2.06	1.4
2251+158	3C454.3	1980.281	1994.996	.859	404	.491	.58	2.80	.525	.76	1.42	2.1
2253+417		1988.127	1994.708	1.476	9	.599	.72	1.52	.560	.65	.99	1.3
2254+024		1993.519	1993.538	2.090	2	.292	.38	.63	.847	1.18	1.72	1.2
2255-282		1989.309	1995.562	.926	121	.497	.72	1.93	.684	.98	2.33	2.1
2318+049		1989.423	1993.730	.623	5	.537	1.08	1.67	.692	.75	1.33	1.5
2319+272		1989.870	1995.279	1.253	2	.220	.53	1.49	.263	.59	1.34	1.4
2320+506		1992.269	1994.398		2	.038	.05	.03	.439	.65	3.47	1.8
2326-477		1993.074	1994.756	1.306	2	.611	.91	4.07	.120	.17	.06	2.1
2328+107		1988.320	1994.708	1.489	7	.429	.50	1.11	.528	.61	.66	.9
2329-162		1988.041	1994.815	1.153	2	.238	.47	.50	.173	.35	.55	.5
2331-240		1991.380	1994.123	.048	4	.578	.72	1.02	.424	.67	.87	.9
2337+264		1992.074	1995.357		4	.962	1.60	6.67	.635	.89	1.97	4.3
2344+092	2344+09A	1990.533	1994.661	.673	3	.092	.11	.06	.261	.32	.23	.1
2345-167		1986.026	1993.351	.576	16	.721	.85	1.34	.567	.64	1.01	1.2
2351+456		1988.309	1994.708	1.992	12	.473	.50	.82	.463	.50	.63	.7
2352+495		1988.127	1994.839	.237	5	1.158	1.28	3.12	1.347	1.52	4.34	3.7
2355-534		1990.393	1993.088	1.006	5	.571	.65	1.78	.651	.81	.99	1.4
2355-106		1992.039	1994.469	1.622	18	.595	.81	1.61	.489	.63	1.26	1.4

Figure III.4. shows the time evolution of the astrometric position in right ascension and declination for 379 ICRF sources, every ICRF source with two or more arc position estimates with formal errors less than 1 mas in both components of position. In each case the observed right ascension residual was multiplied by the cosine of the declination to provide true arc lengths on the sky.

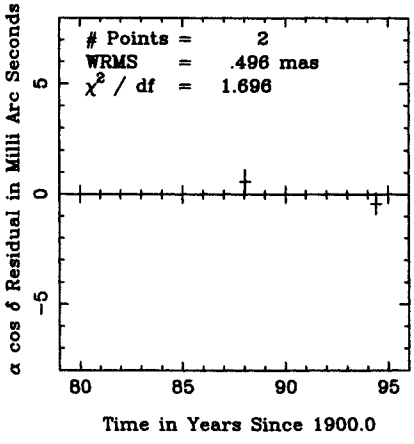
Arc Solution for 0003+380 : $\alpha \cos \delta$



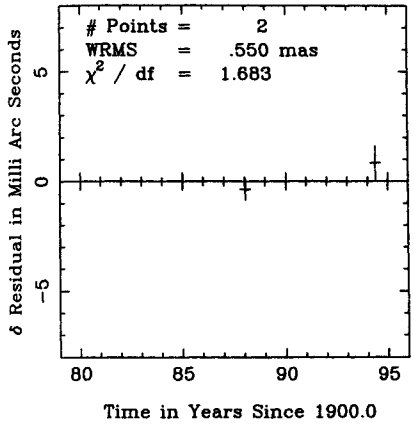
Arc Solution for 0003+380 : δ



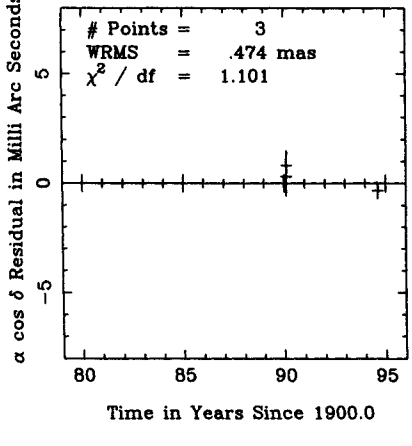
Arc Solution for 0003−066 : $\alpha \cos \delta$



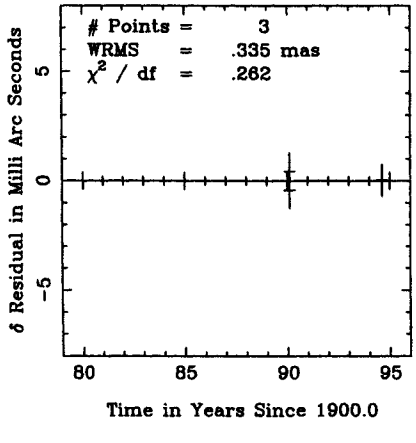
Arc Solution for 0003−066 : δ



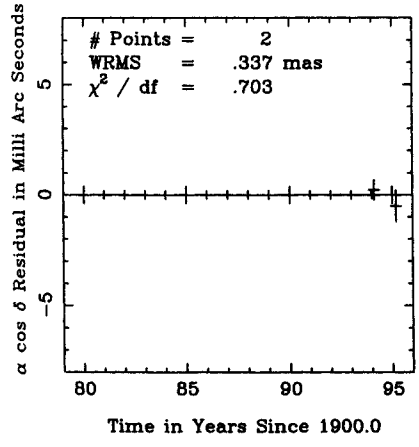
Arc Solution for 0007+171 : $\alpha \cos \delta$



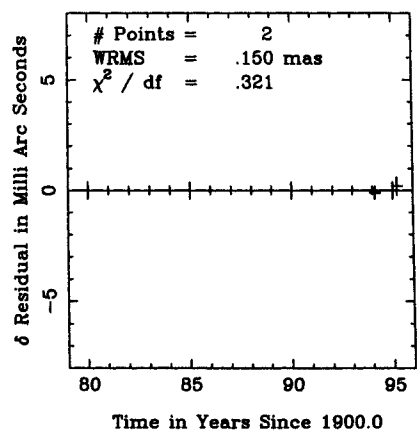
Arc Solution for 0007+171 : δ



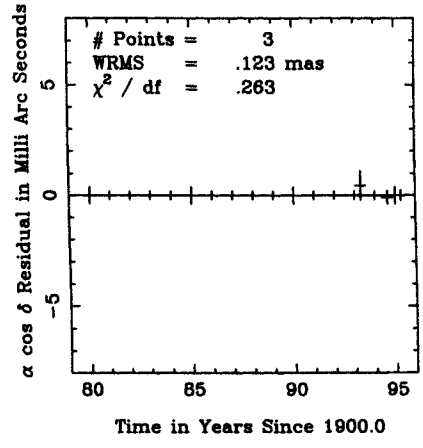
Arc Solution for 0008−264 : $\alpha \cos \delta$



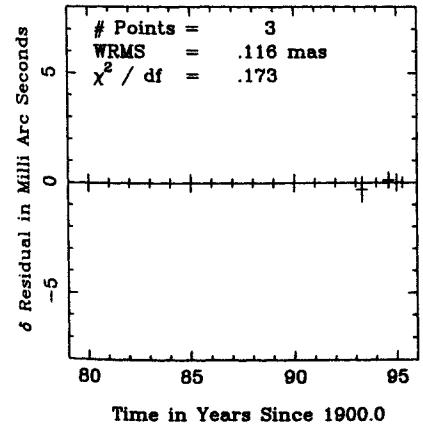
Arc Solution for 0008−264 : δ



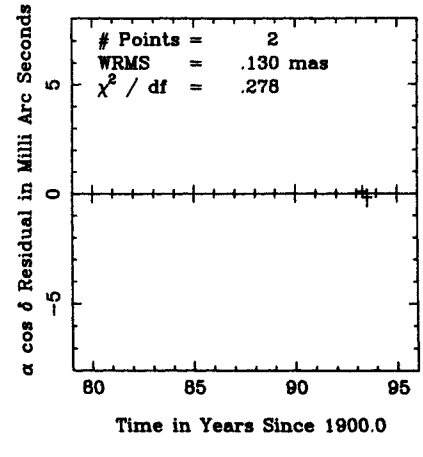
Arc Solution for 0010+405 : $\alpha \cos \delta$



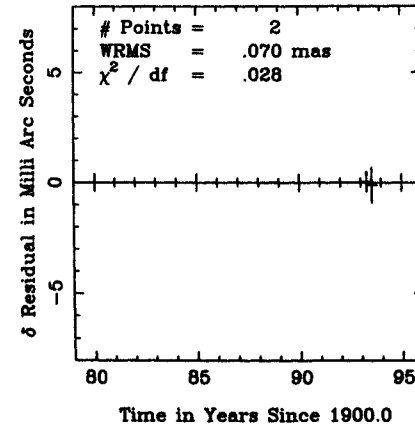
Arc Solution for 0010+405 : δ



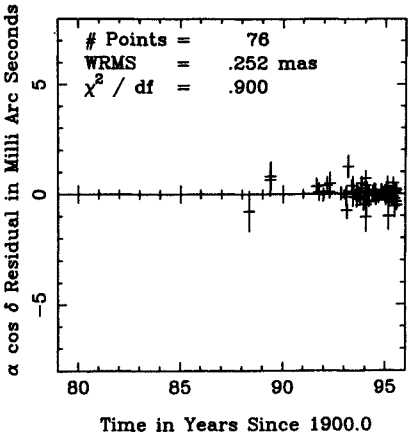
Arc Solution for 0013−005 : $\alpha \cos \delta$



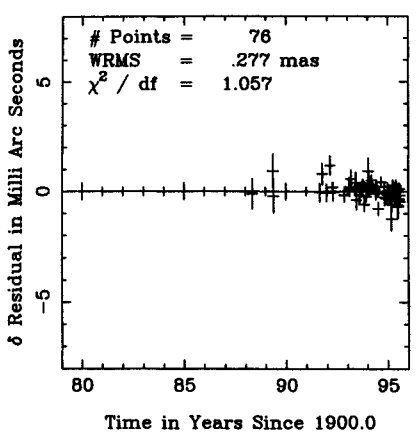
Arc Solution for 0013−005 : δ



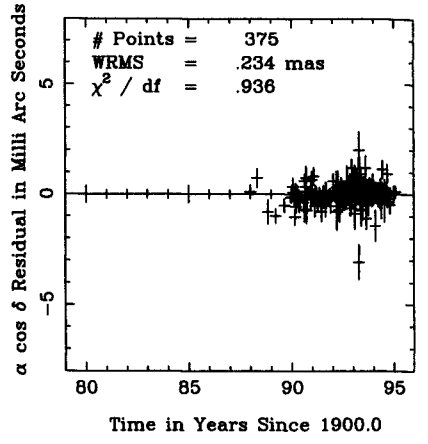
Arc Solution for 0014+813 : α cos δ



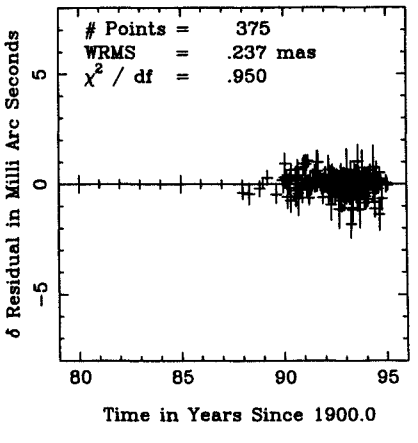
Arc Solution for 0014+813 : δ



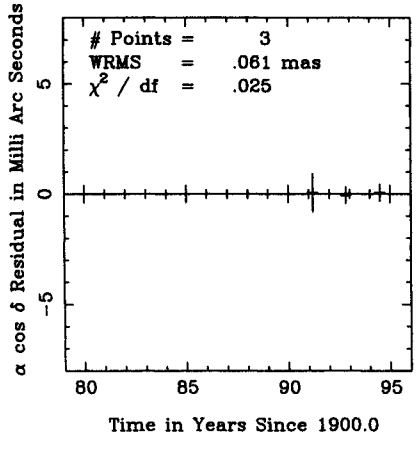
Arc Solution for 0016+731 : α cos δ



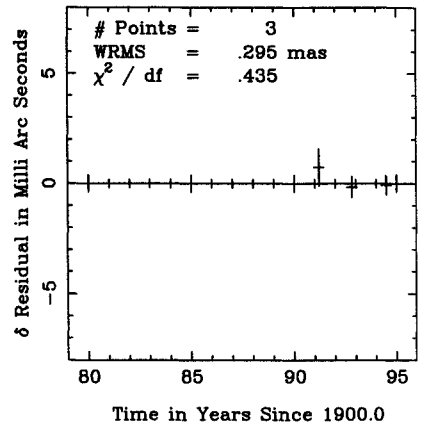
Arc Solution for 0016+731 : δ



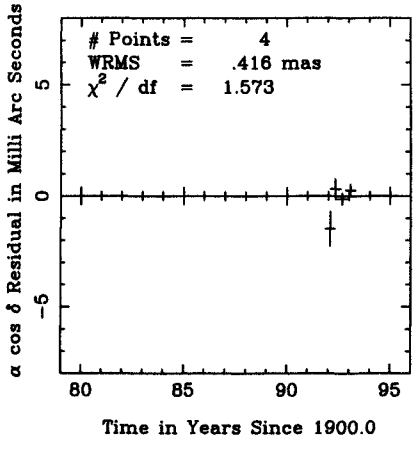
Arc Solution for 0039+230 : α cos δ



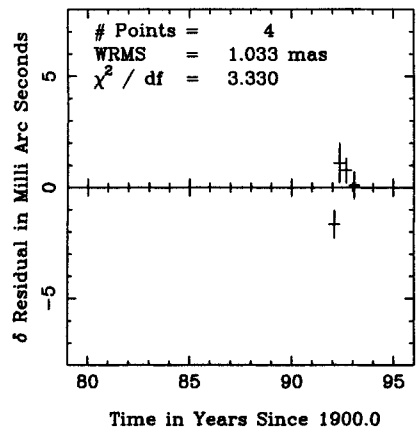
Arc Solution for 0039+230 : δ



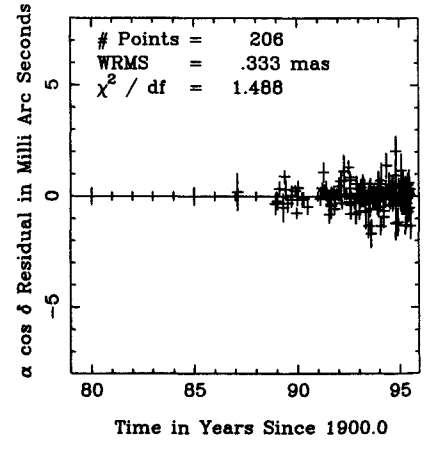
Arc Solution for 0047−579 : α cos δ



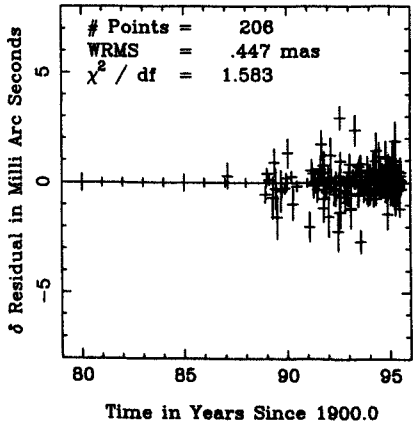
Arc Solution for 0047−579 : δ



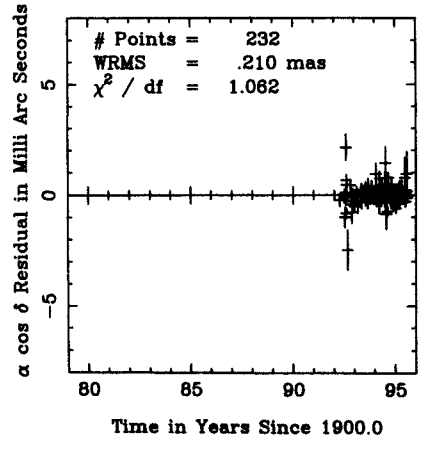
Arc Solution for 0048−097 : α cos δ



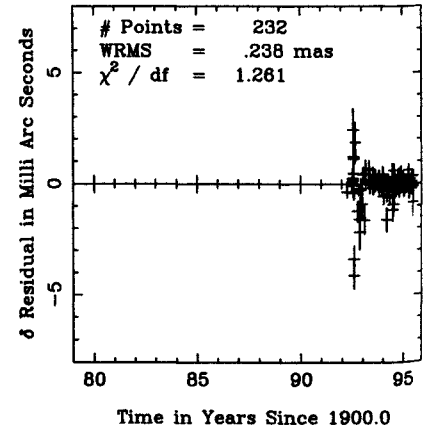
Arc Solution for 0048−097 : δ



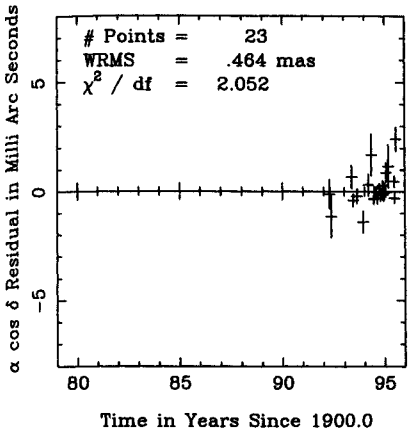
Arc Solution for 0059+581 : α cos δ



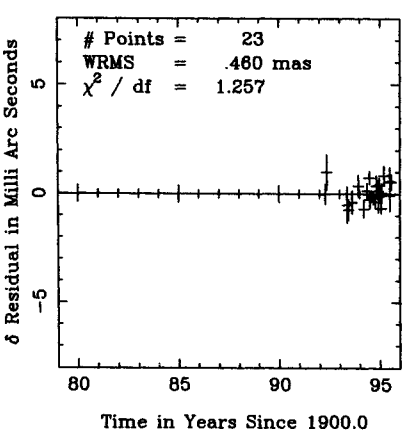
Arc Solution for 0059+581 : δ



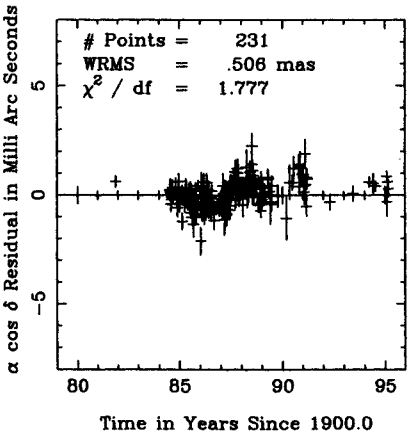
Arc Solution for 0104−408 : α cos δ



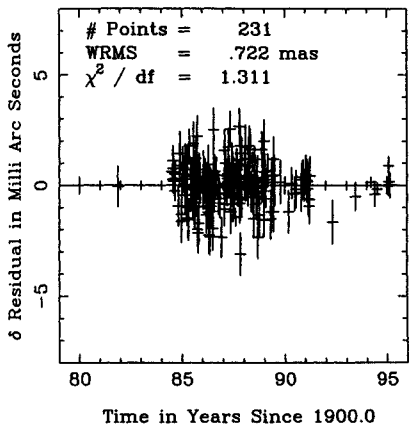
Arc Solution for 0104−408 : δ



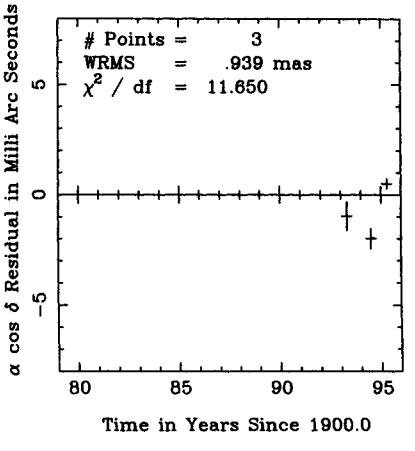
Arc Solution for 0106+013 : α cos δ



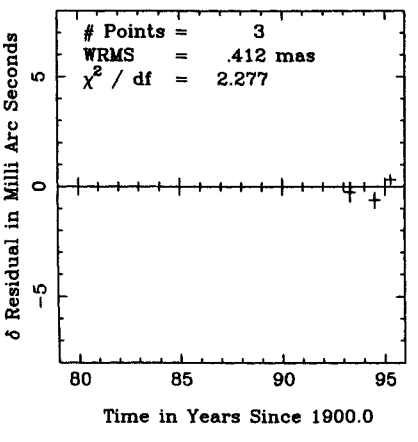
Arc Solution for 0106+013 : δ



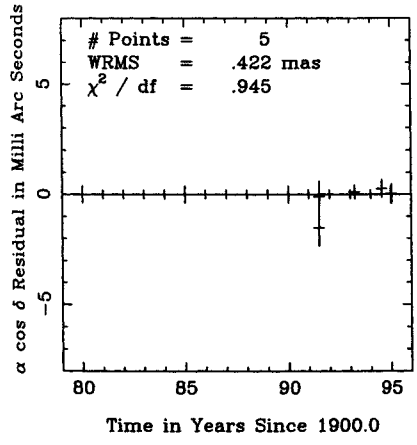
Arc Solution for 0108+388 : α cos δ



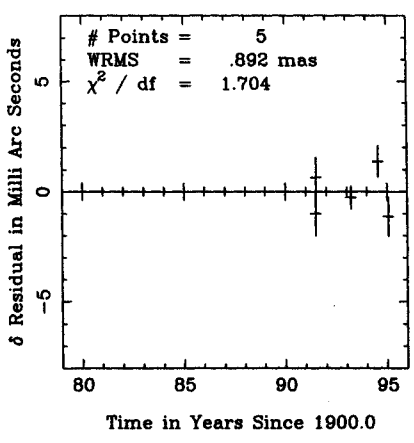
Arc Solution for 0108+388 : δ



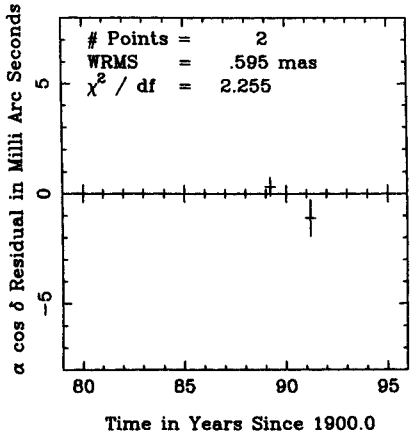
Arc Solution for 0109+224 : α cos δ



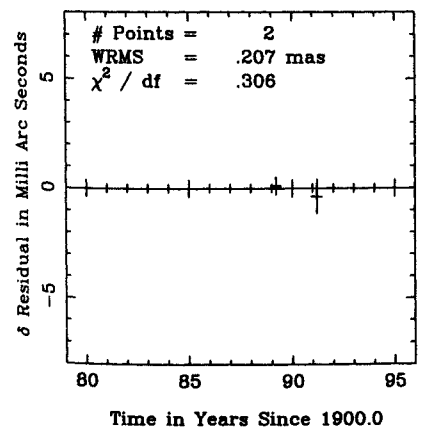
Arc Solution for 0109+224 : δ



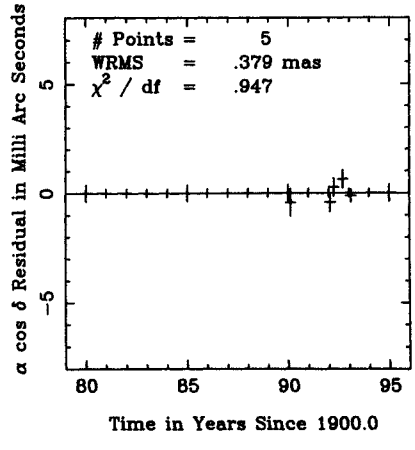
Arc Solution for 0112−017 : α cos δ



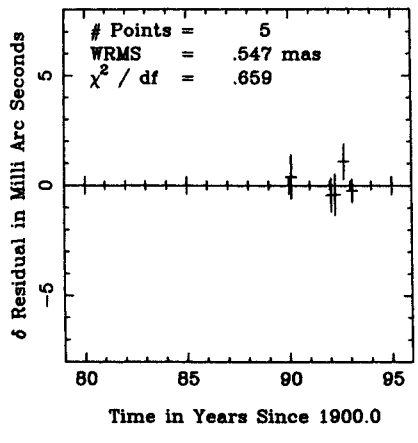
Arc Solution for 0112−017 : δ



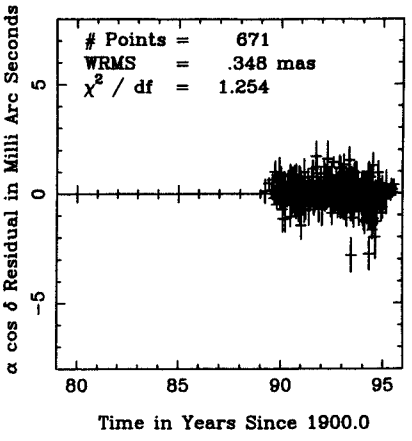
Arc Solution for 0119+115 : α cos δ



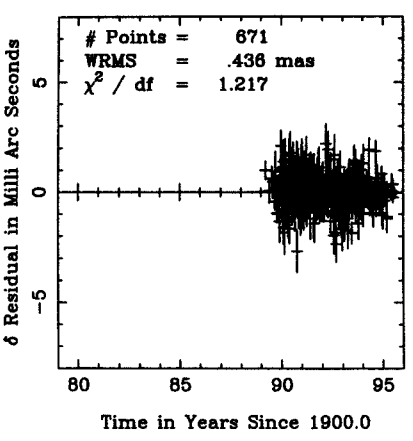
Arc Solution for 0119+115 : δ



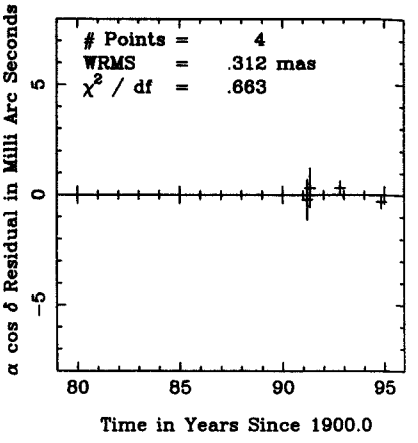
Arc Solution for 0119+041 : α cos δ



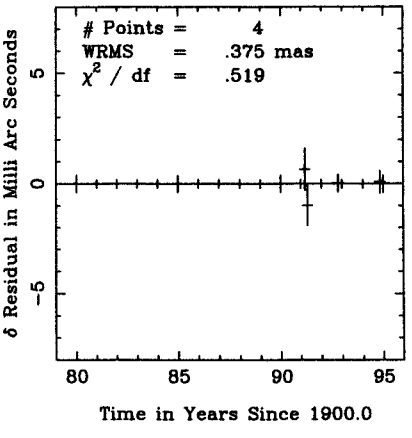
Arc Solution for 0119+041 : δ



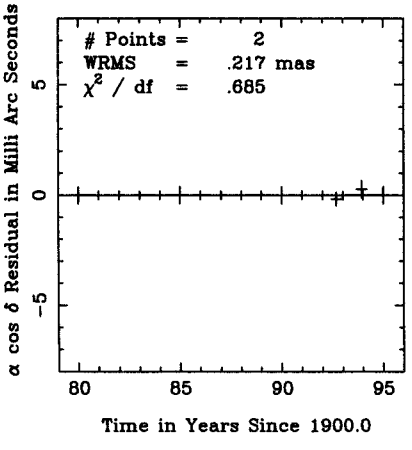
Arc Solution for 0123+257 : α cos δ



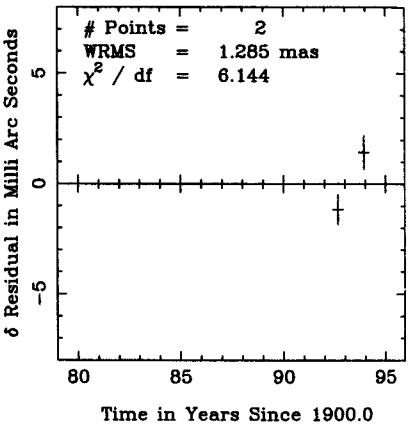
Arc Solution for 0123+257 : δ



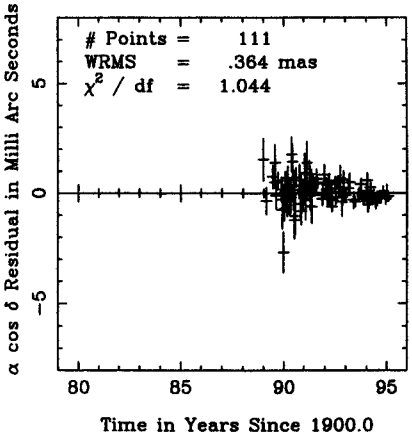
Arc Solution for 0131−522 : α cos δ



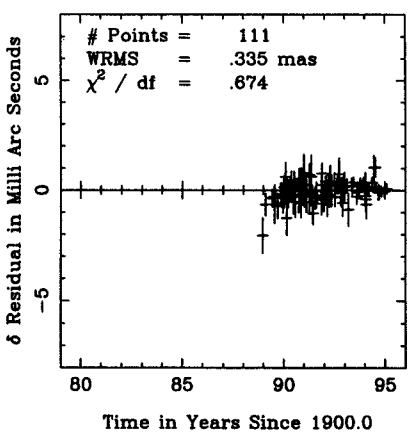
Arc Solution for 0131−522 : δ



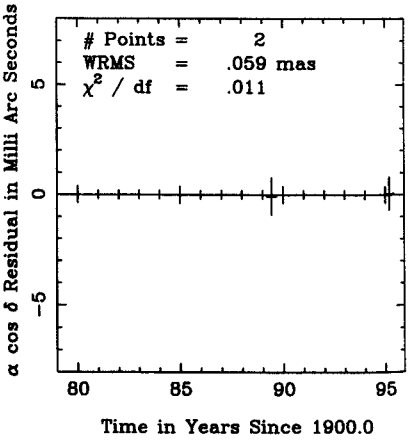
Arc Solution for 0133+476 : α cos δ



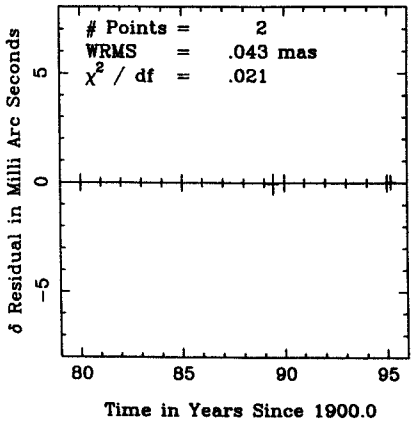
Arc Solution for 0133+476 : δ



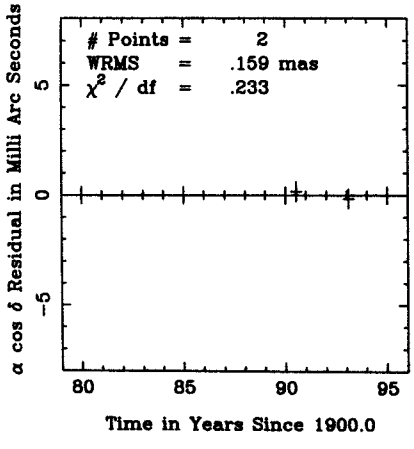
Arc Solution for 0135−247 : α cos δ



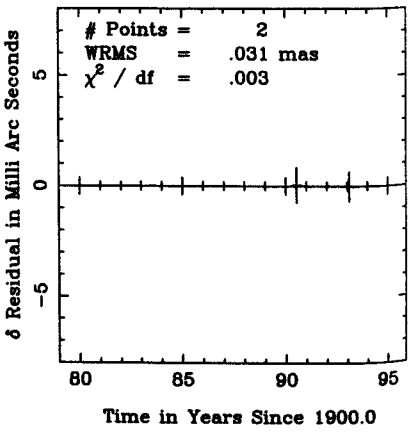
Arc Solution for 0135−247 : δ



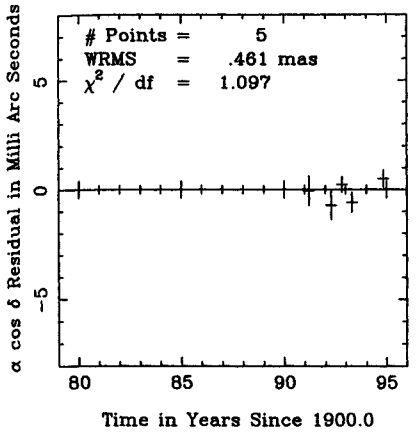
Arc Solution for 0146+056 : α cos δ



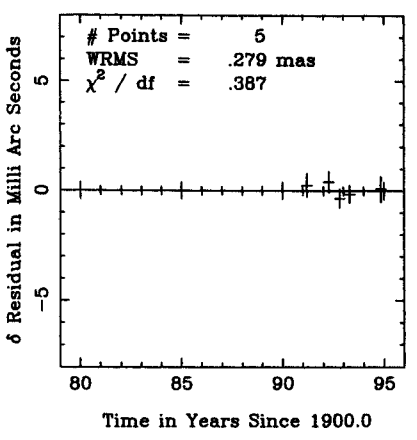
Arc Solution for 0146+056 : δ



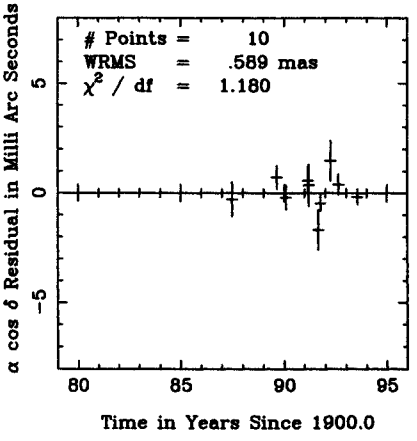
Arc Solution for 0148+274 : α cos δ



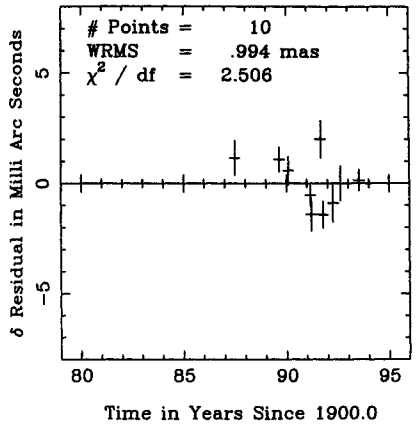
Arc Solution for 0148+274 : δ



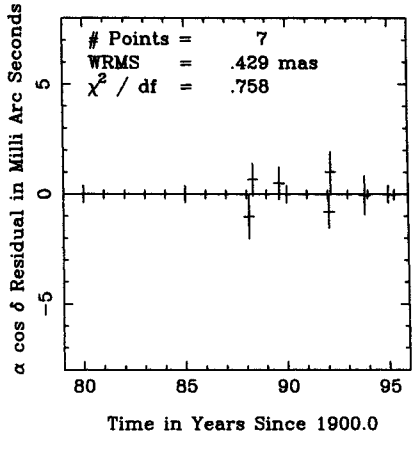
Arc Solution for 0149+218 : α cos δ



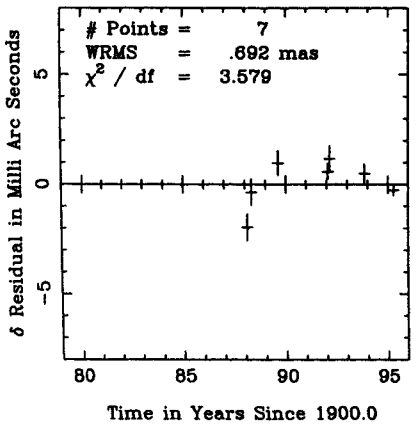
Arc Solution for 0149+218 : δ



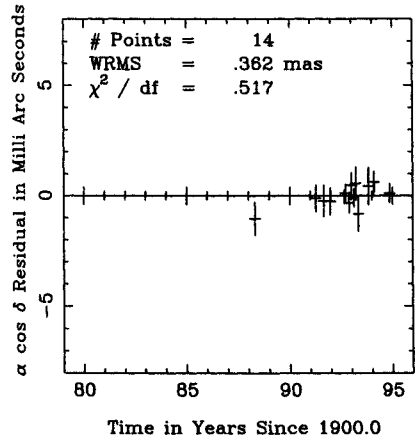
Arc Solution for 0153+744 : α cos δ



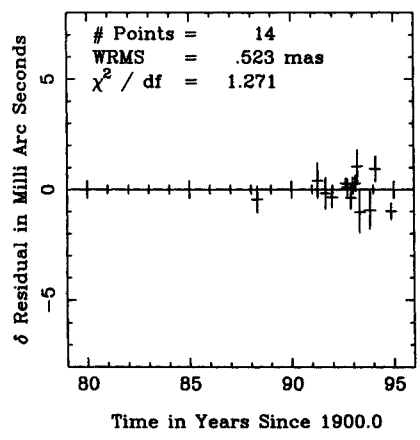
Arc Solution for 0153+744 : δ



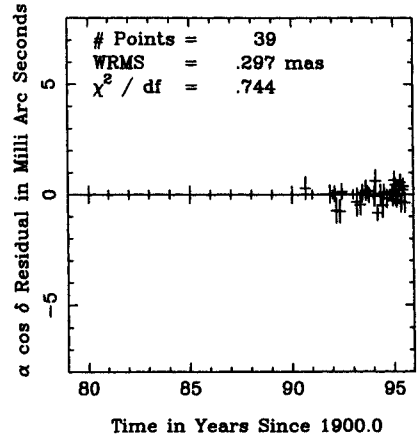
Arc Solution for 0159+723 : α cos δ



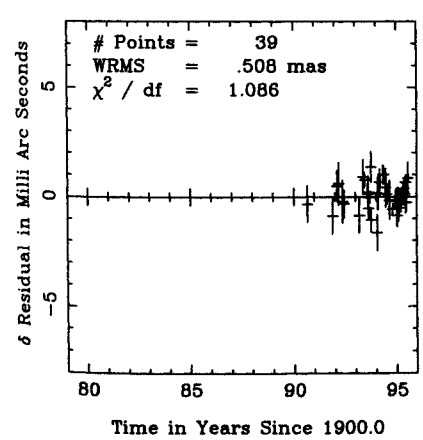
Arc Solution for 0159+723 : δ



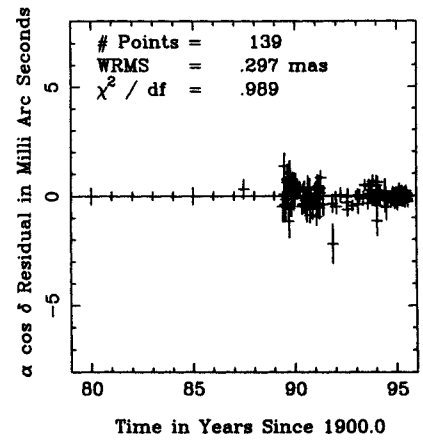
Arc Solution for 0201+113 : α cos δ



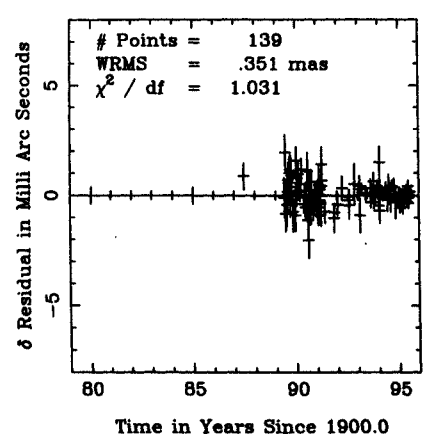
Arc Solution for 0201+113 : δ



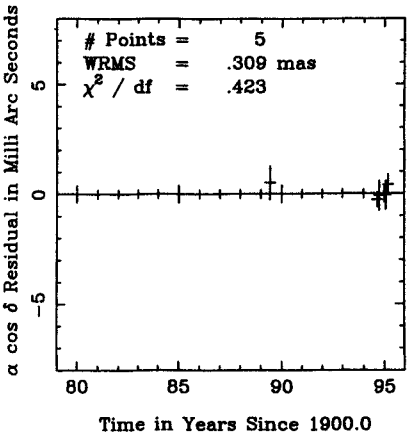
Arc Solution for 0202+149 : α cos δ



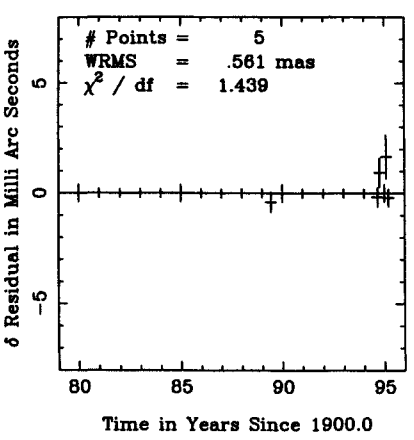
Arc Solution for 0202+149 : δ



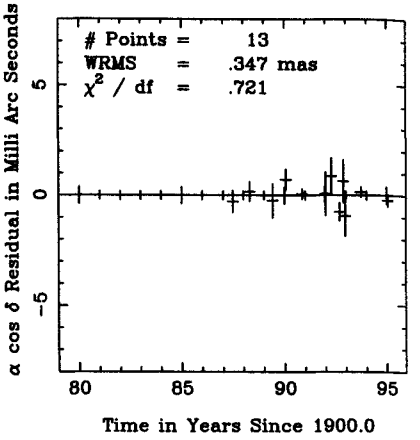
Arc Solution for 0202−172 : α cos δ



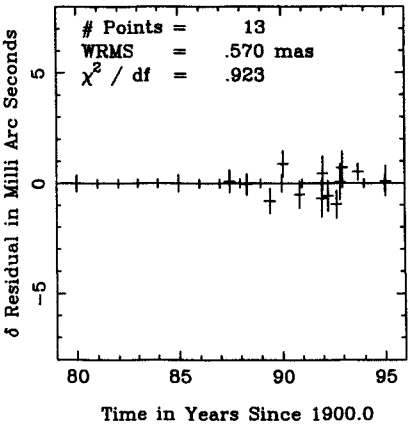
Arc Solution for 0202−172 : δ



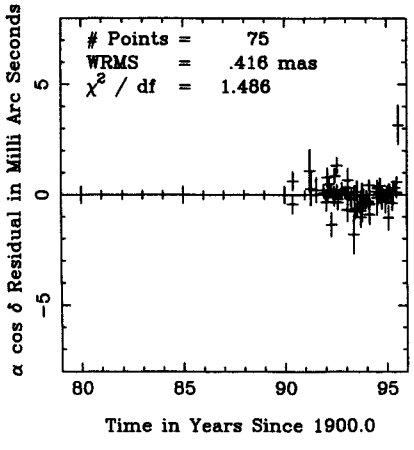
Arc Solution for 0202+319 : α cos δ



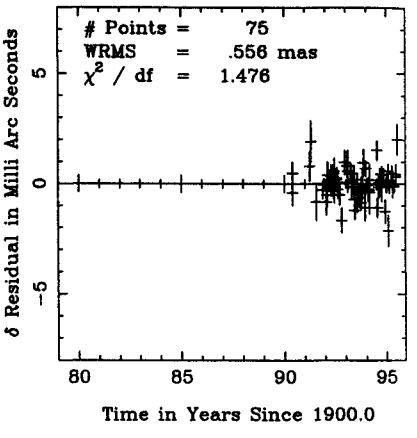
Arc Solution for 0202+319 : δ



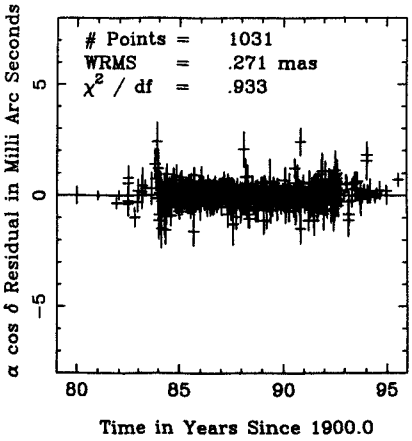
Arc Solution for 0208−512 : α cos δ



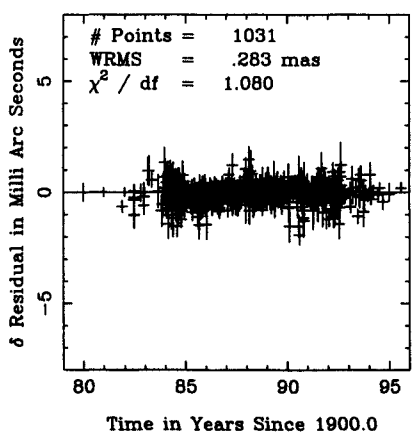
Arc Solution for 0208−512 : δ



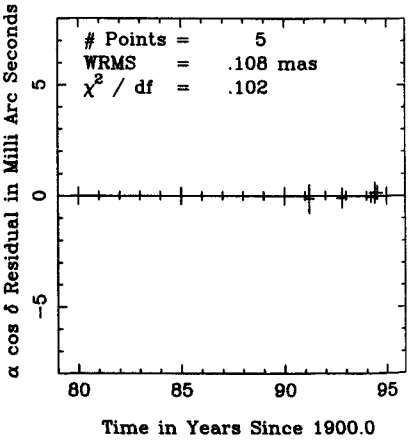
Arc Solution for 0212+735 : α cos δ



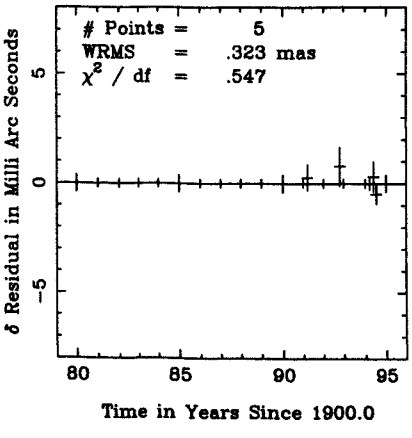
Arc Solution for 0212+735 : δ



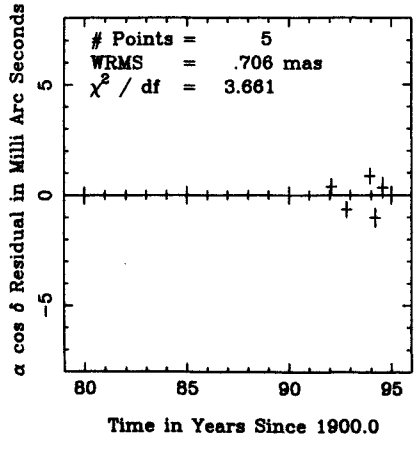
Arc Solution for 0215+015 : α cos δ



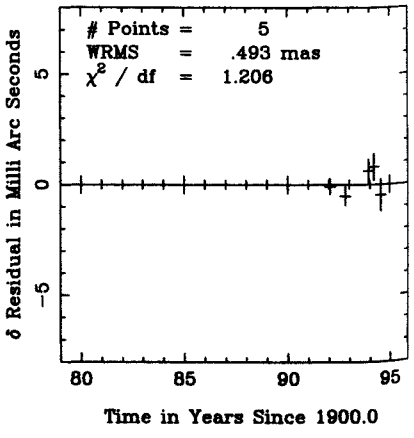
Arc Solution for 0215+015 : δ



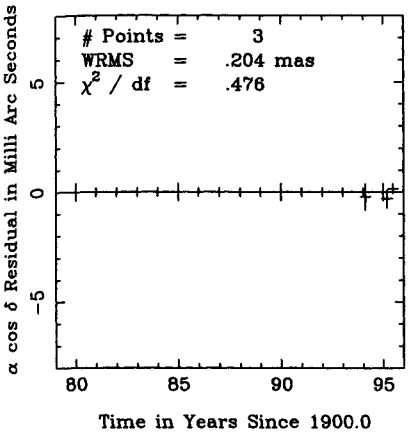
Arc Solution for 0219+428 : α cos δ



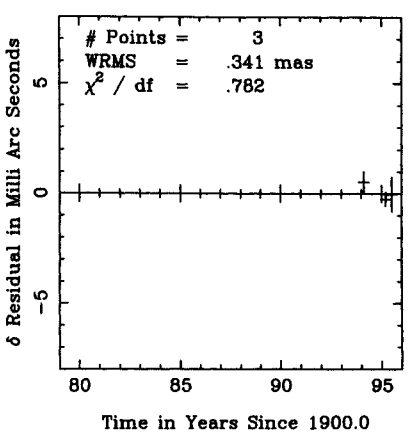
Arc Solution for 0219+428 : δ



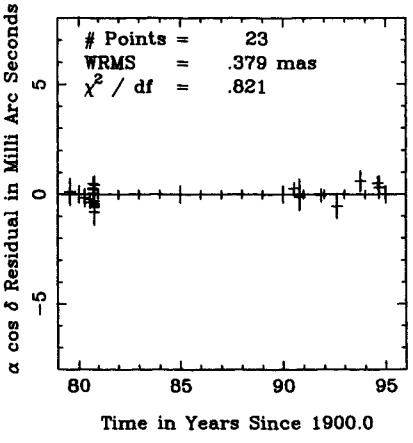
Arc Solution for 0220−349 : α cos δ



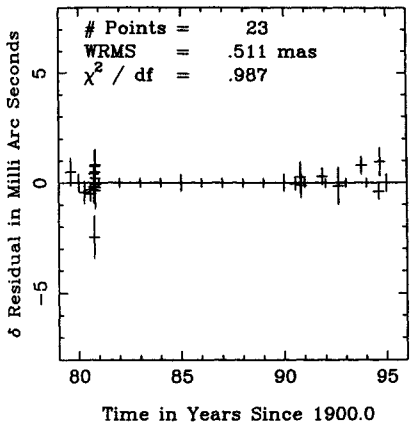
Arc Solution for 0220−349 : δ



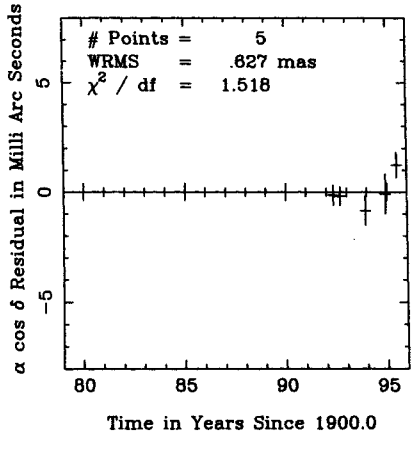
Arc Solution for 0224+671 : α cos δ



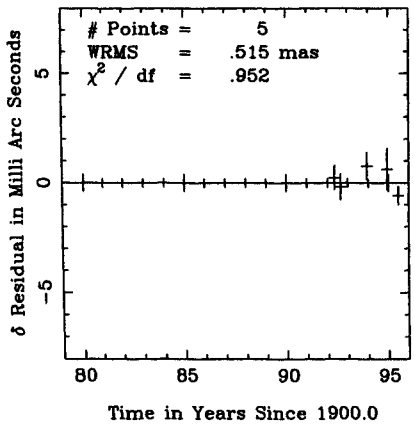
Arc Solution for 0224+671 : δ



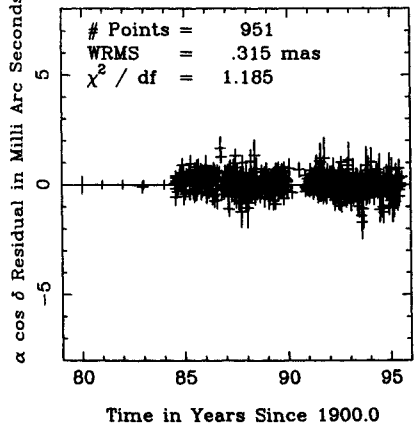
Arc Solution for 0230−790 : α cos δ



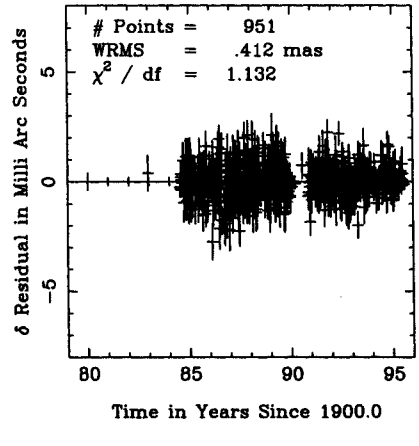
Arc Solution for 0230−790 : δ



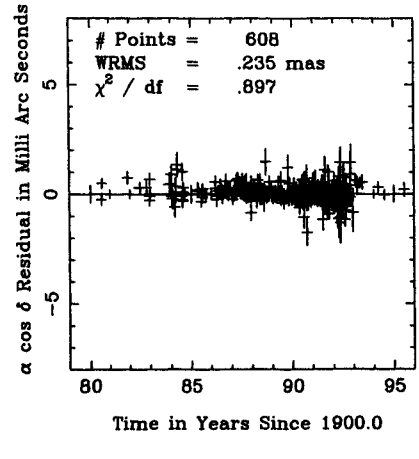
Arc Solution for 0229+131 : α cos δ



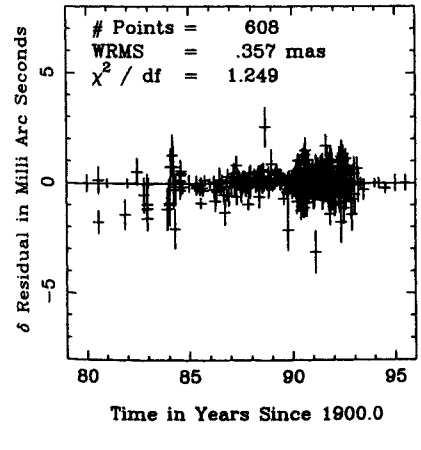
Arc Solution for 0229+131 : δ



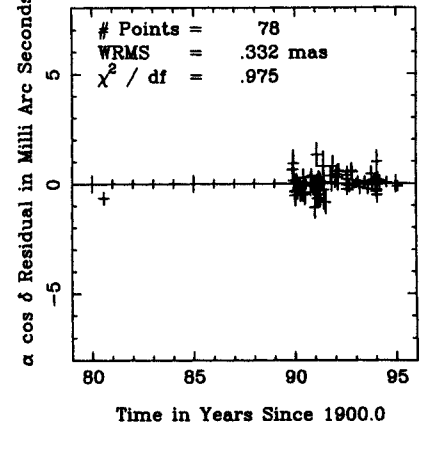
Arc Solution for 0234+285 : α cos δ



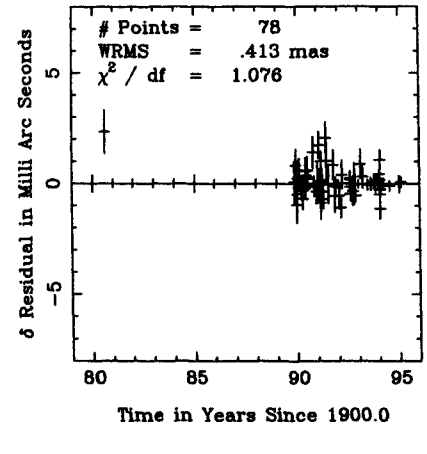
Arc Solution for 0234+285 : δ



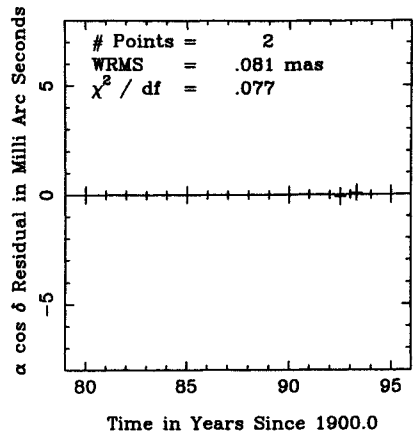
Arc Solution for 0235+164 : α cos δ



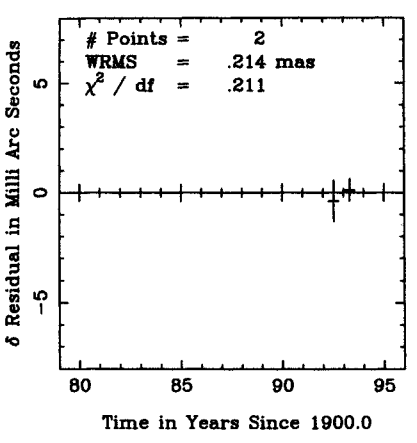
Arc Solution for 0235+164 : δ



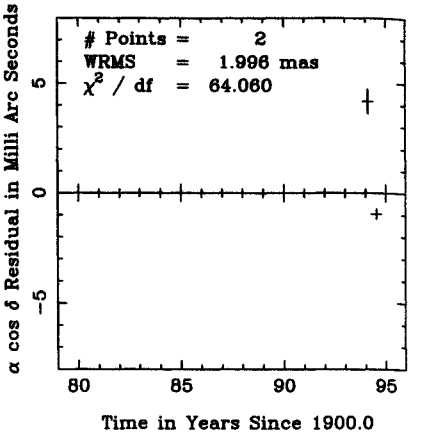
Arc Solution for 0237+040 : α cos δ



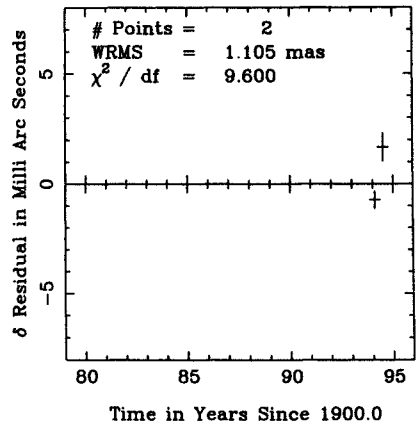
Arc Solution for 0237+040 : δ



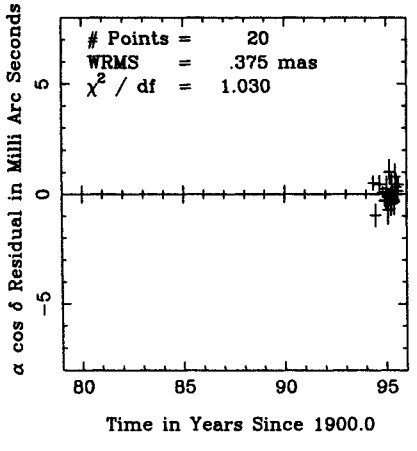
Arc Solution for 0237−233 : α cos δ



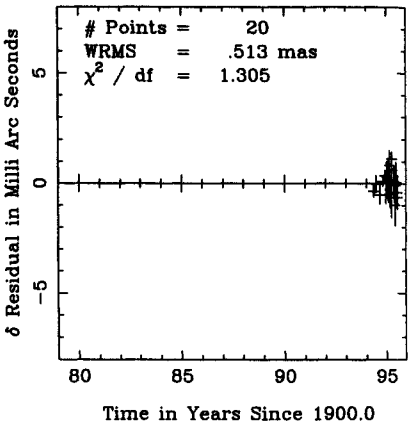
Arc Solution for 0237−233 : δ



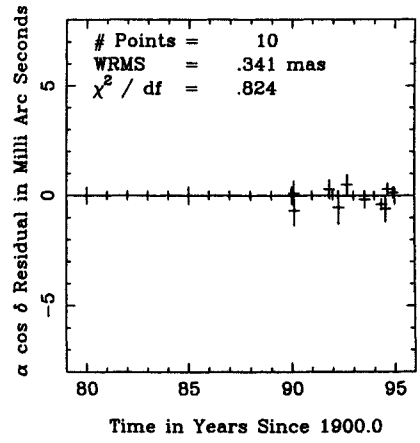
Arc Solution for 0238−084 : α cos δ



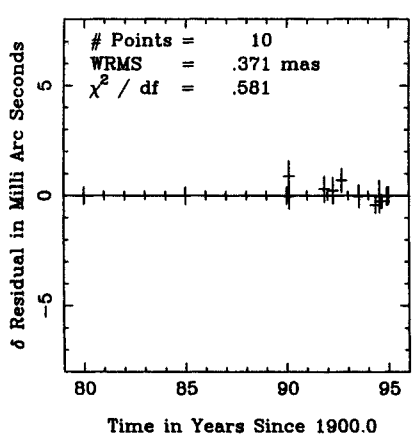
Arc Solution for 0238−084 : δ



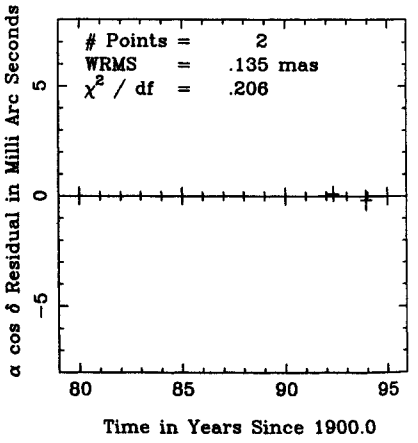
Arc Solution for 0248+430 : α cos δ



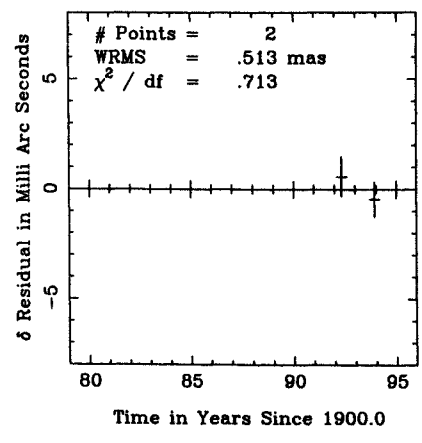
Arc Solution for 0248+430 : δ



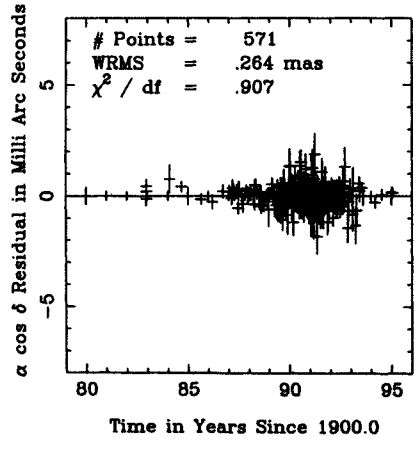
Arc Solution for 0252−549 : α cos δ



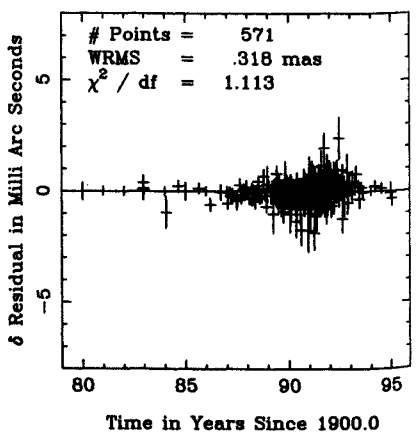
Arc Solution for 0252−549 : δ



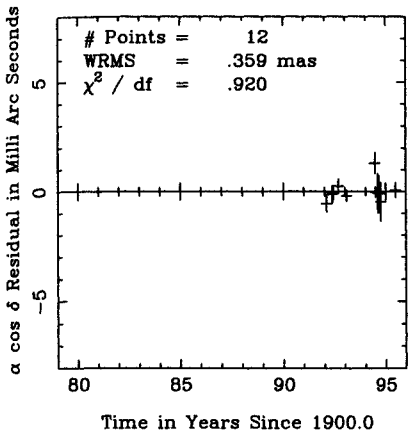
Arc Solution for 0300+470 : α cos δ



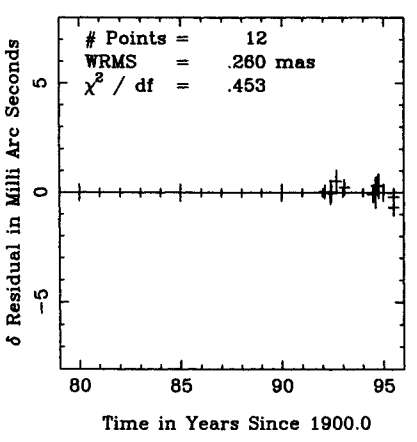
Arc Solution for 0300+470 : δ



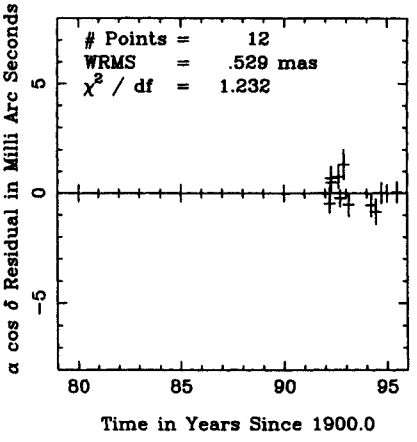
Arc Solution for 0302−623 : α cos δ



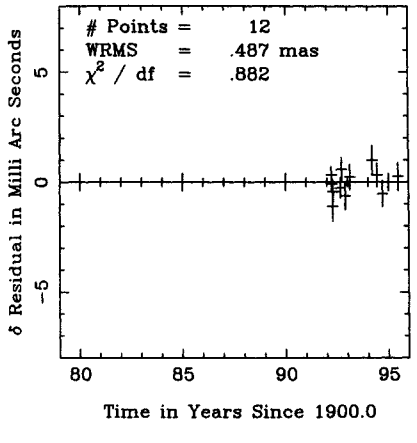
Arc Solution for 0302−623 : δ



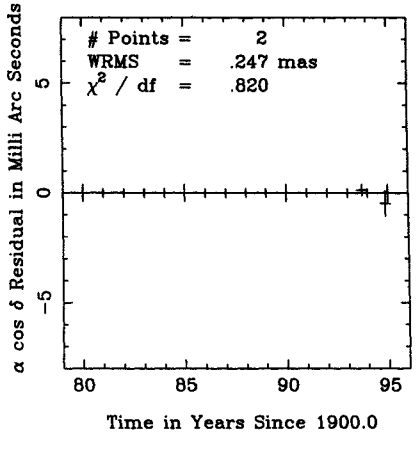
Arc Solution for 0302+625 : α cos δ



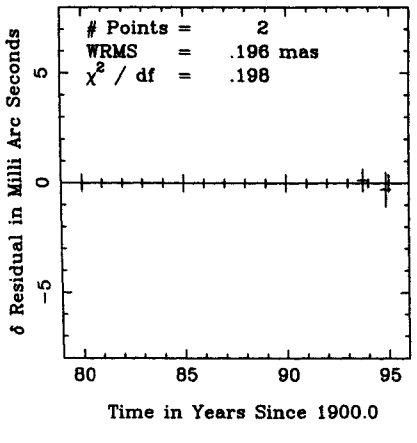
Arc Solution for 0302+625 : δ



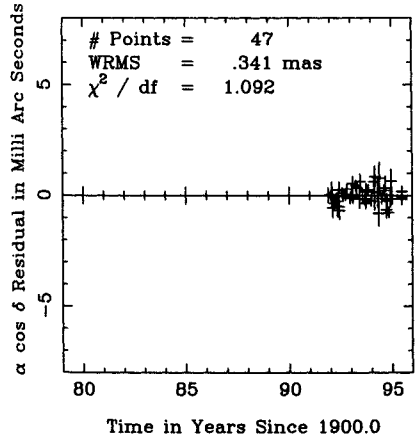
Arc Solution for 0306+102 : α cos δ



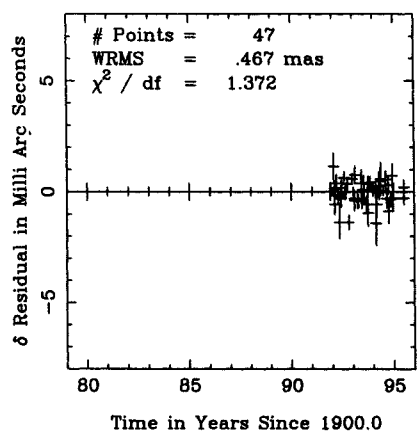
Arc Solution for 0306+102 : δ



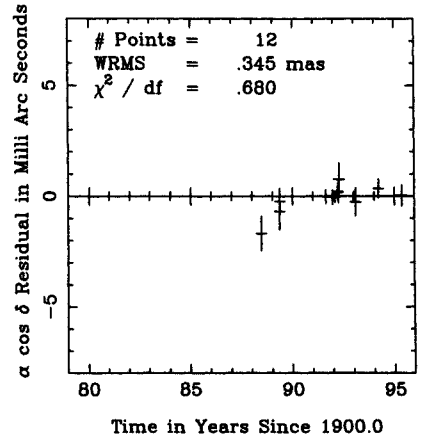
Arc Solution for 0308−611 : α cos δ



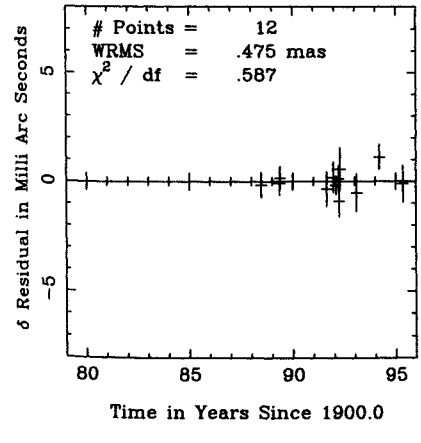
Arc Solution for 0308−611 : δ



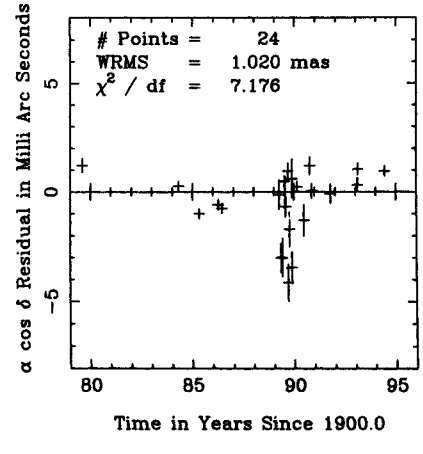
Arc Solution for 0309+411 : α cos δ



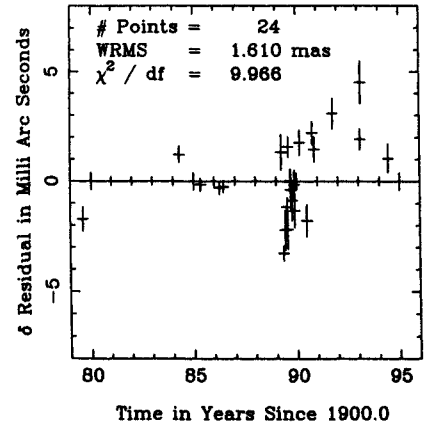
Arc Solution for 0309+411 : δ



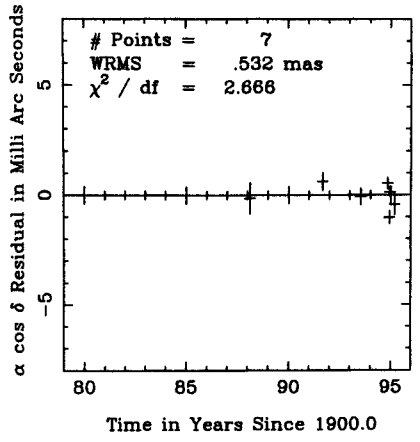
Arc Solution for 0316+413 : α cos δ



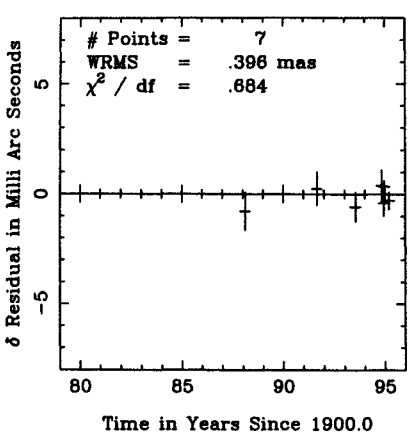
Arc Solution for 0316+413 : δ



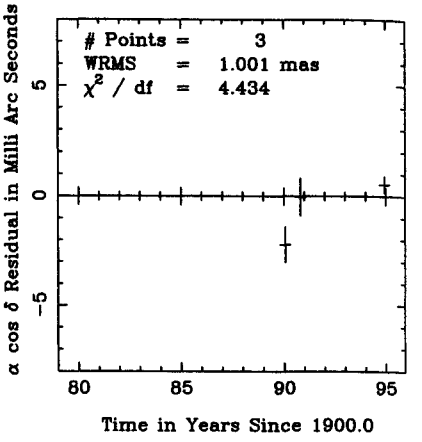
Arc Solution for 0319+121 : $\alpha \cos \delta$



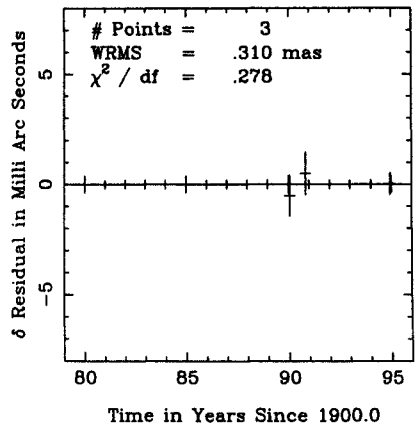
Arc Solution for 0319+121 : δ



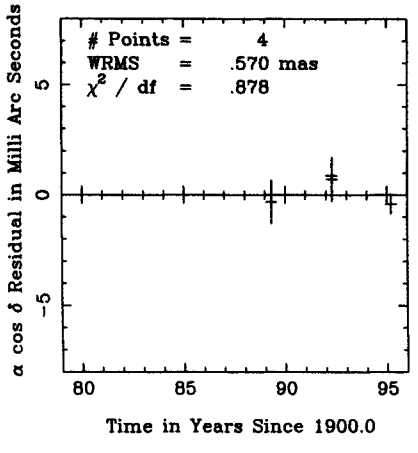
Arc Solution for 0326+277 : $\alpha \cos \delta$



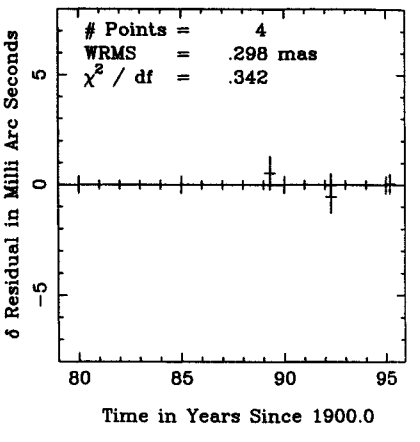
Arc Solution for 0326+277 : δ



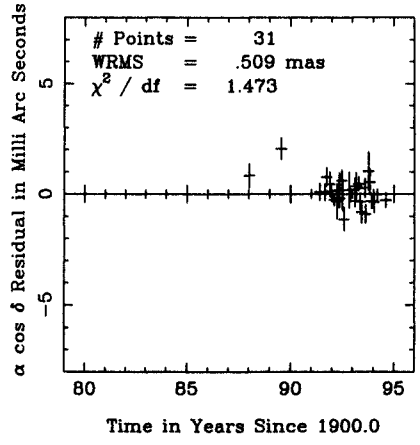
Arc Solution for 0332−403 : $\alpha \cos \delta$



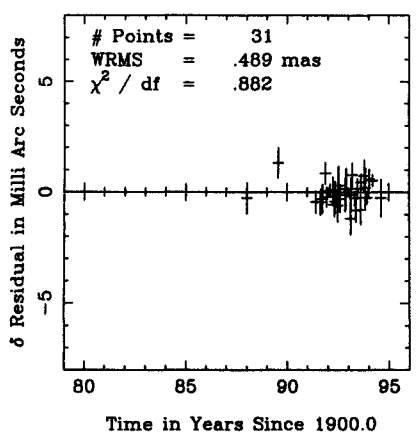
Arc Solution for 0332−403 : δ



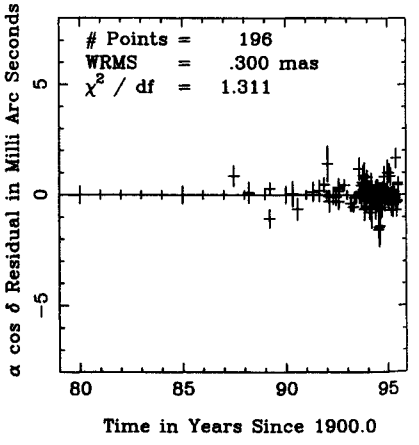
Arc Solution for 0333+321 : $\alpha \cos \delta$



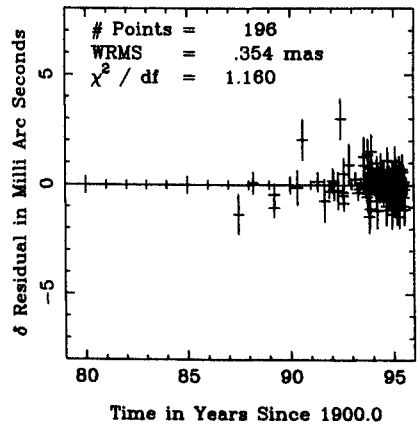
Arc Solution for 0333+321 : δ



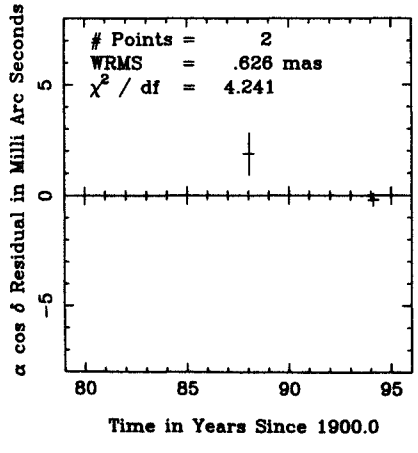
Arc Solution for 0336−019 : $\alpha \cos \delta$



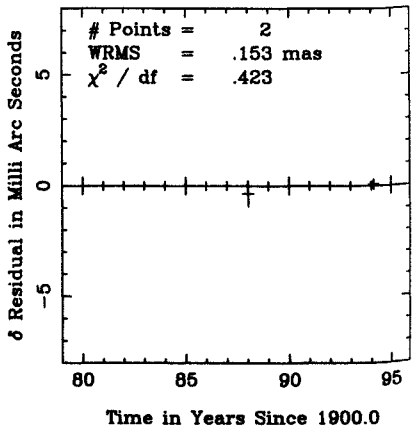
Arc Solution for 0336−019 : δ



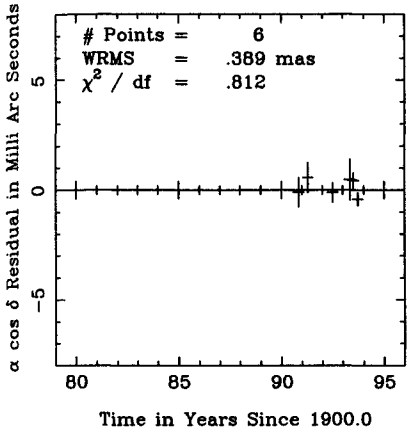
Arc Solution for 0338−214 : $\alpha \cos \delta$



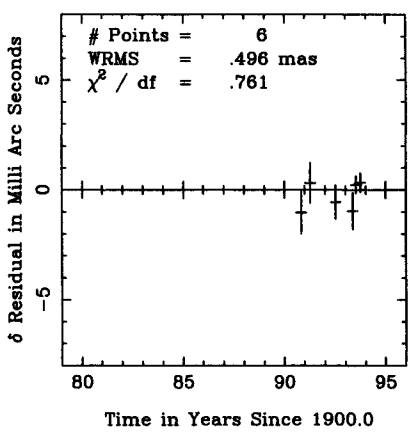
Arc Solution for 0338−214 : δ



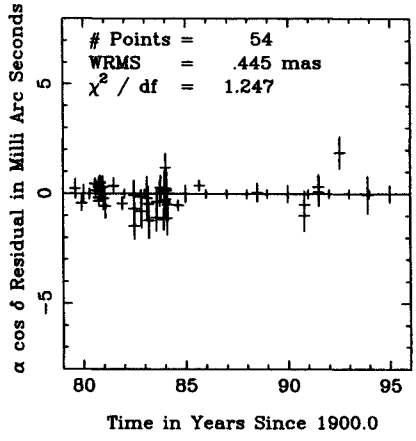
Arc Solution for 0342+147 : α cos δ



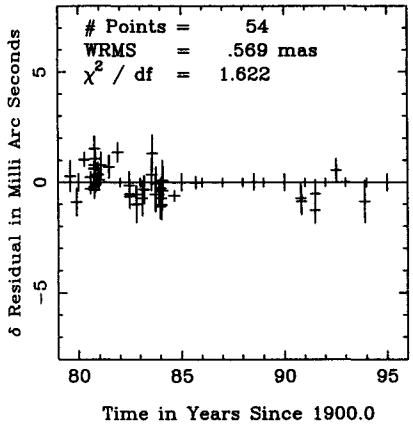
Arc Solution for 0342+147 : δ



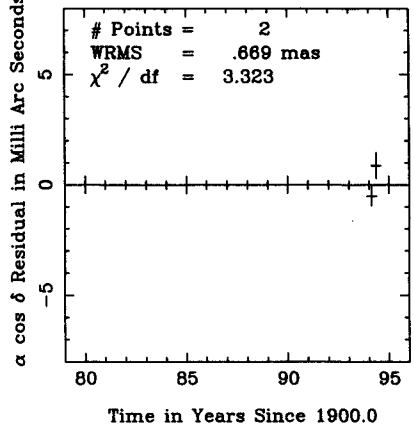
Arc Solution for 0355+508 : α cos δ



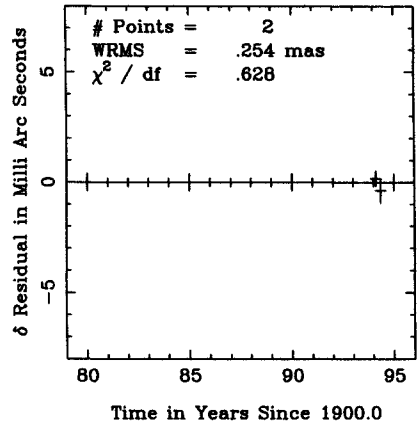
Arc Solution for 0355+508 : δ



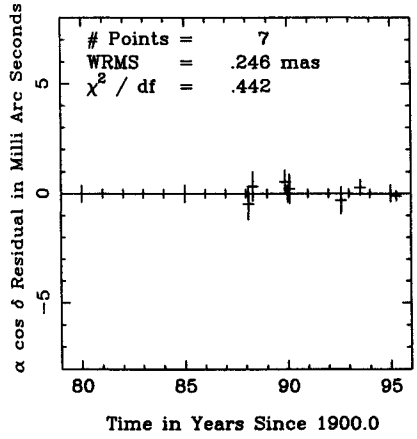
Arc Solution for 0400−319 : α cos δ



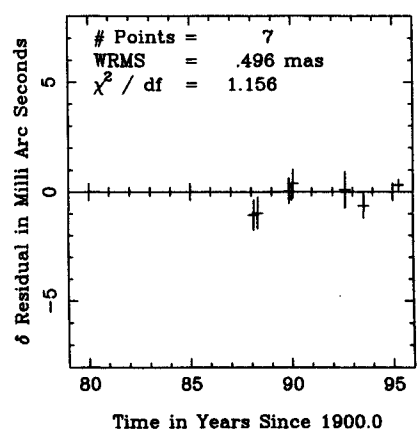
Arc Solution for 0400−319 : δ



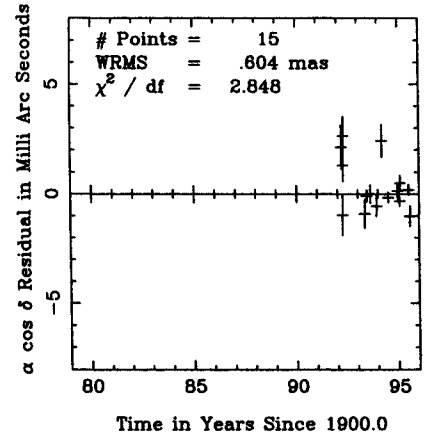
Arc Solution for 0400+258 : α cos δ



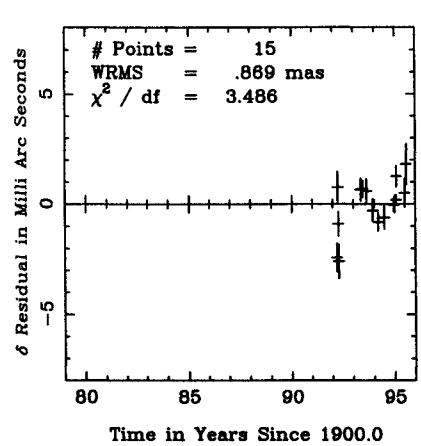
Arc Solution for 0400+258 : δ



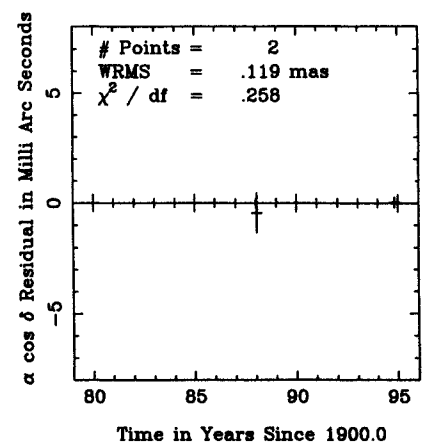
Arc Solution for 0402−362 : α cos δ



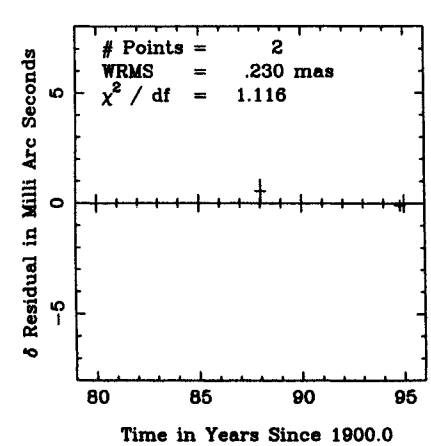
Arc Solution for 0402−362 : δ



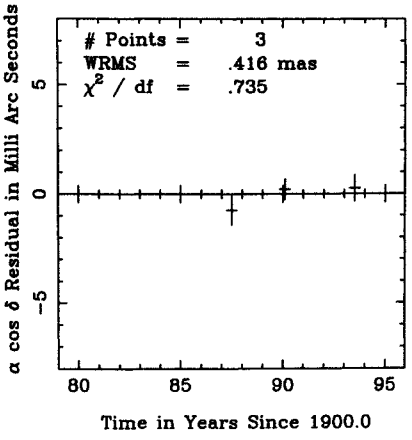
Arc Solution for 0403−132 : α cos δ



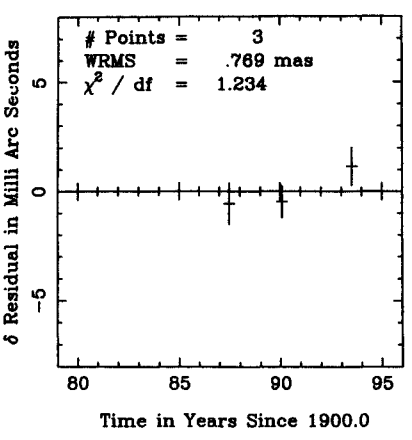
Arc Solution for 0403−132 : δ



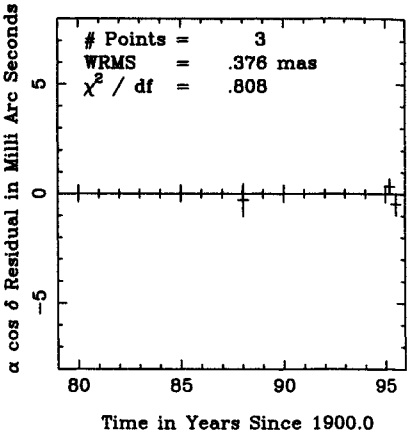
Arc Solution for 0406+121 : $\alpha \cos \delta$



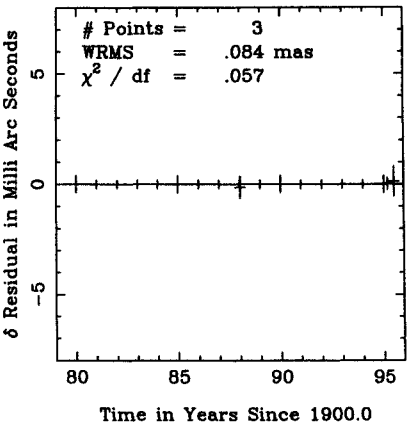
Arc Solution for 0406+121 : δ



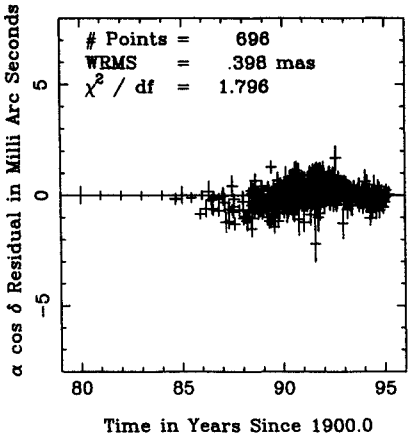
Arc Solution for 0414−189 : $\alpha \cos \delta$



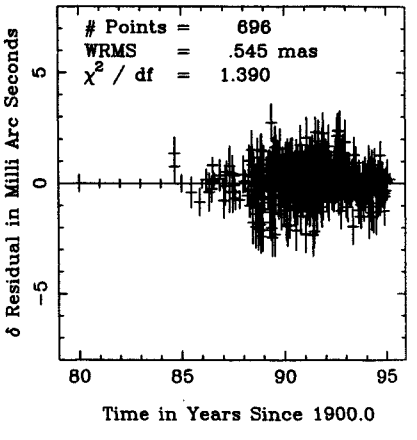
Arc Solution for 0414−189 : δ



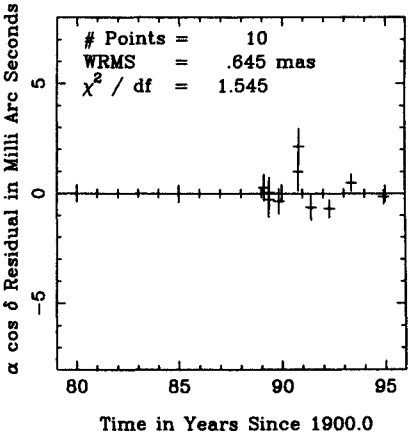
Arc Solution for 0420−014 : $\alpha \cos \delta$



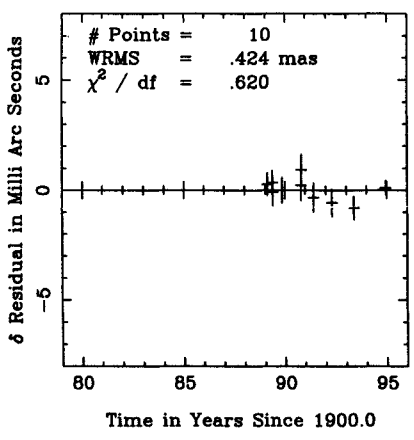
Arc Solution for 0420−014 : δ



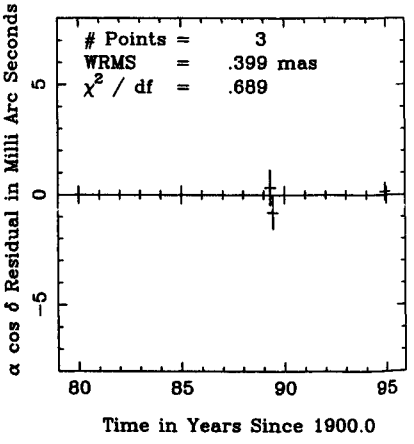
Arc Solution for 0420+417 : $\alpha \cos \delta$



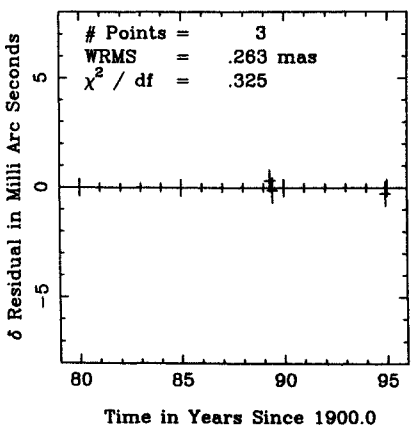
Arc Solution for 0420+417 : δ



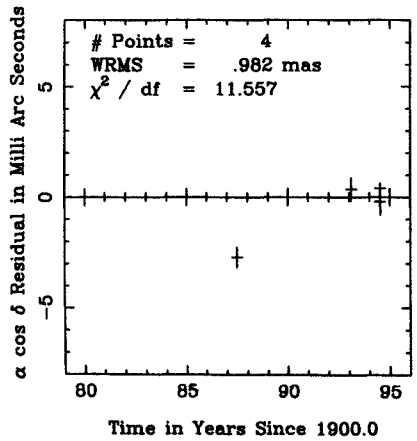
Arc Solution for 0426−380 : $\alpha \cos \delta$



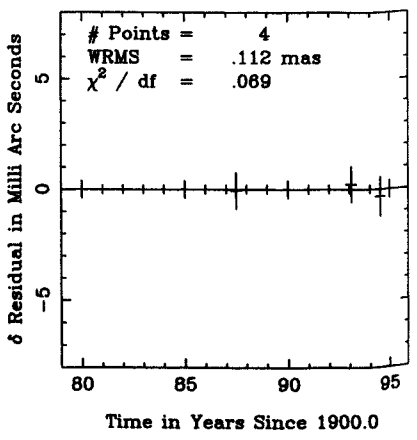
Arc Solution for 0426−380 : δ



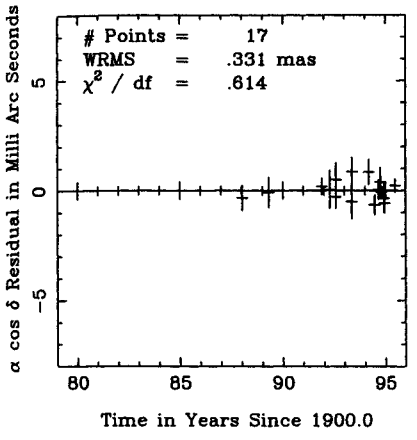
Arc Solution for 0430+052 : $\alpha \cos \delta$



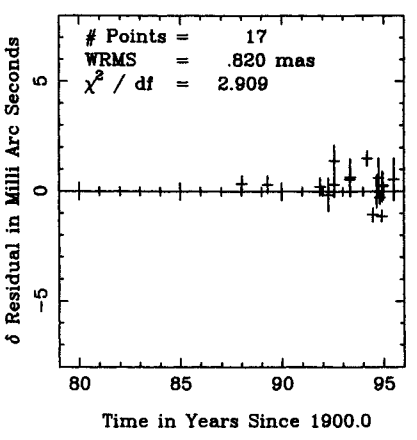
Arc Solution for 0430+052 : δ



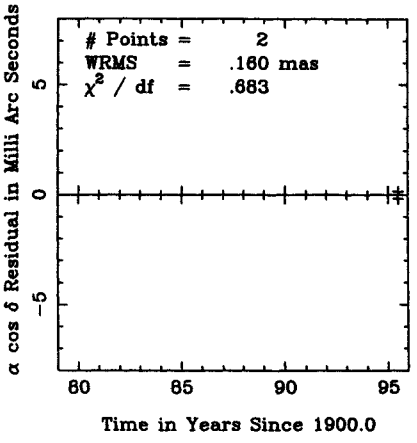
Arc Solution for 0434−188 : α cos δ



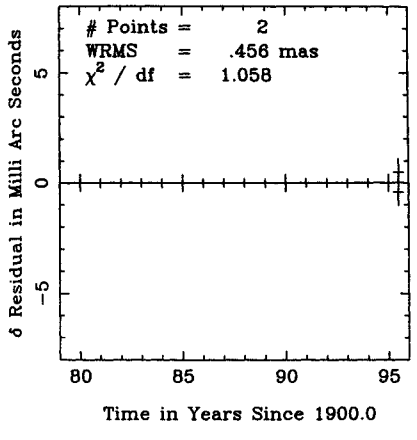
Arc Solution for 0434−188 : δ



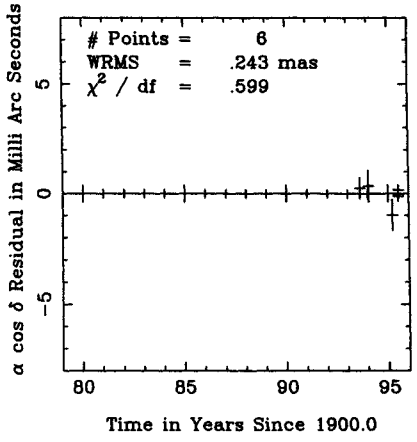
Arc Solution for 0437−454 : α cos δ



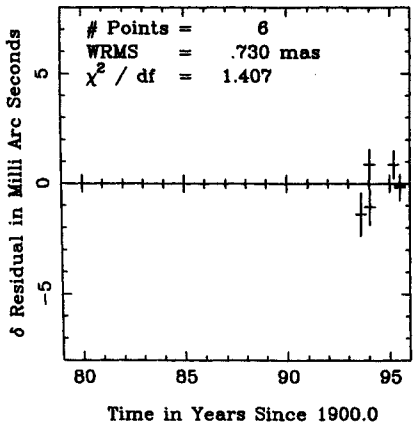
Arc Solution for 0437−454 : δ



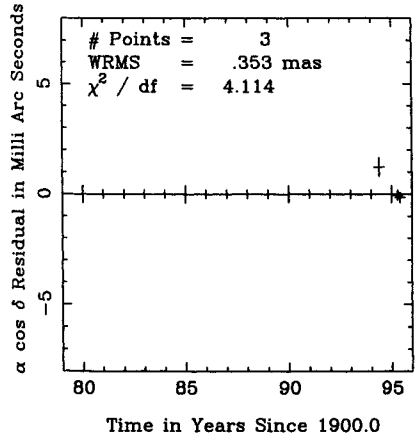
Arc Solution for 0438−436 : α cos δ



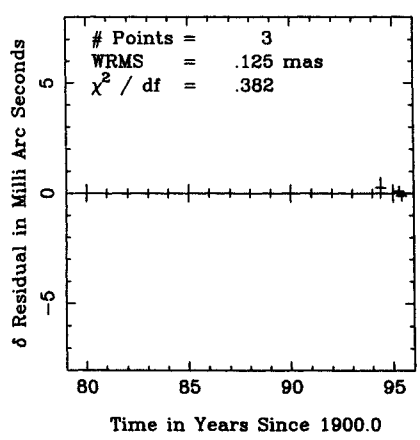
Arc Solution for 0438−436 : δ



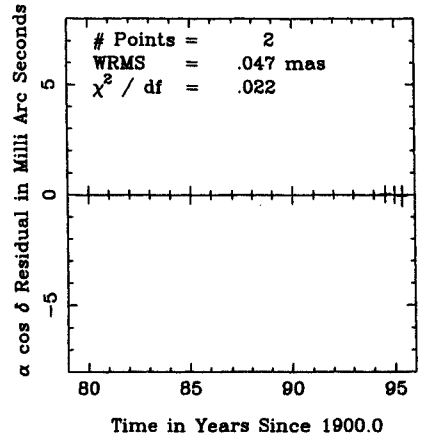
Arc Solution for 0440+345 : α cos δ



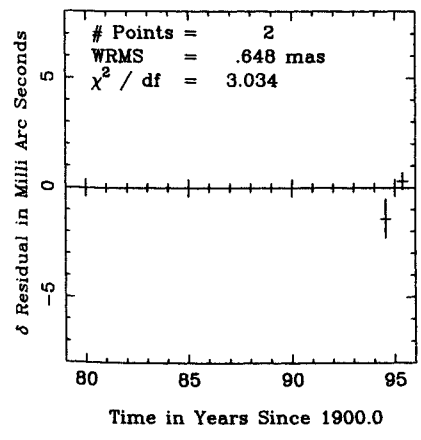
Arc Solution for 0440+345 : δ



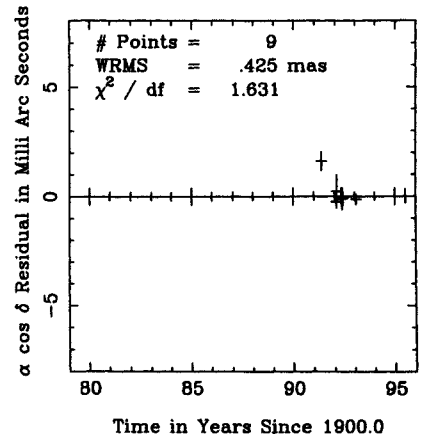
Arc Solution for 0446+112 : α cos δ



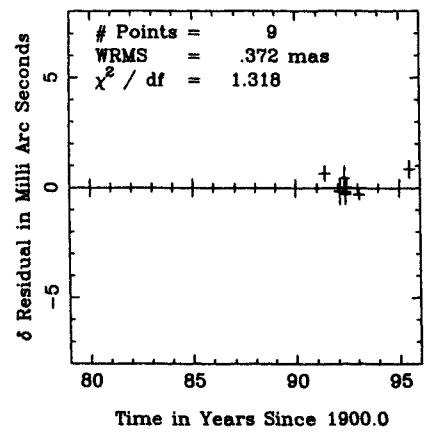
Arc Solution for 0446+112 : δ



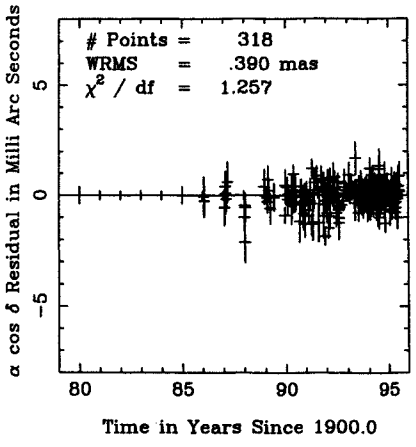
Arc Solution for 0454−810 : α cos δ



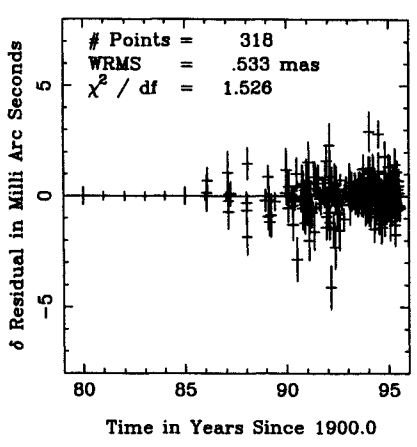
Arc Solution for 0454−810 : δ



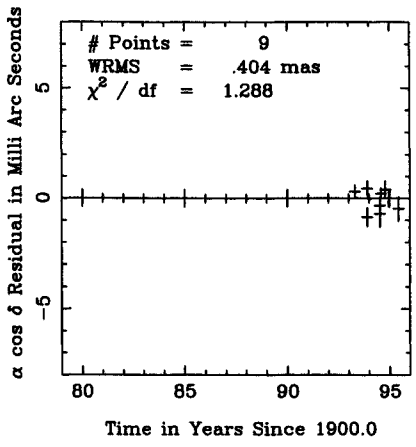
Arc Solution for 0454−234 : α cos δ



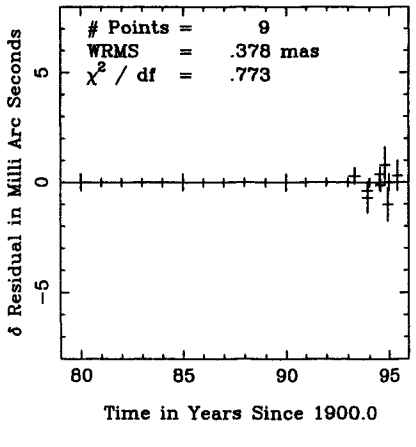
Arc Solution for 0454−234 : δ



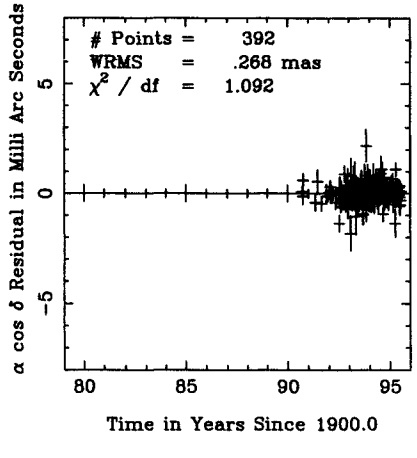
Arc Solution for 0457+024 : α cos δ



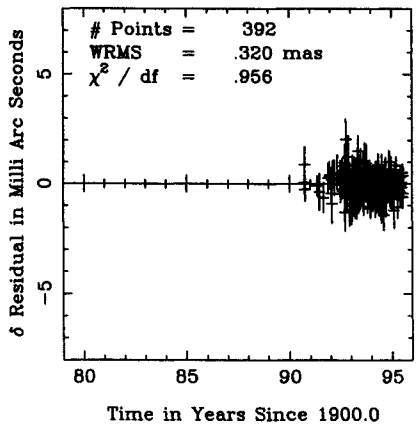
Arc Solution for 0457+024 : δ



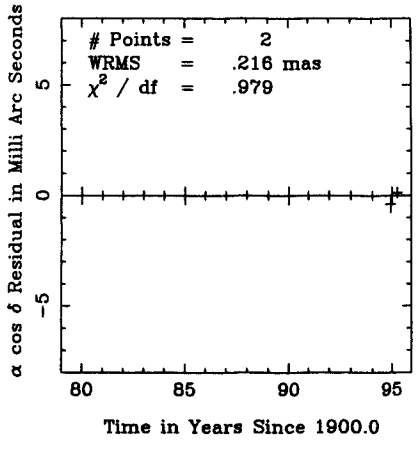
Arc Solution for 0458−020 : α cos δ



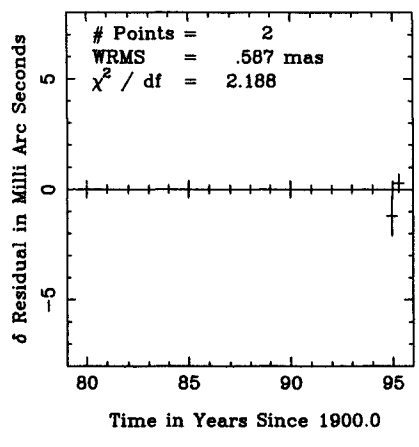
Arc Solution for 0458−020 : δ



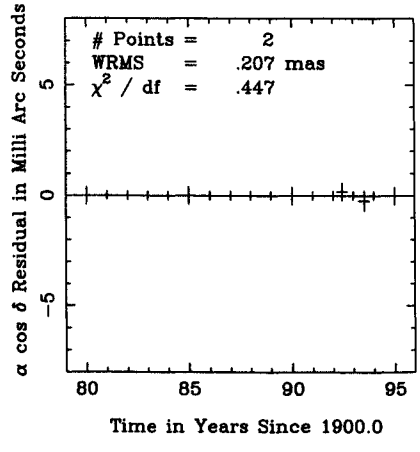
Arc Solution for 0459+060 : α cos δ



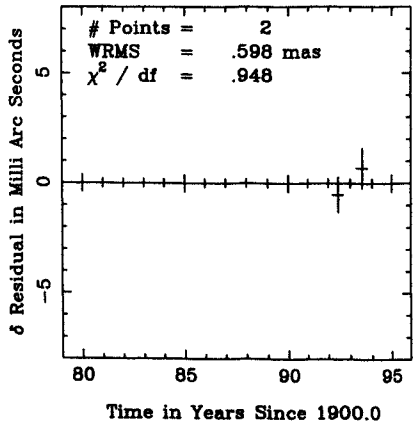
Arc Solution for 0459+060 : δ



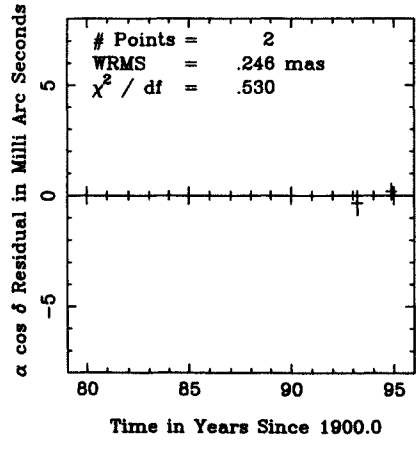
Arc Solution for 0500+019 : α cos δ



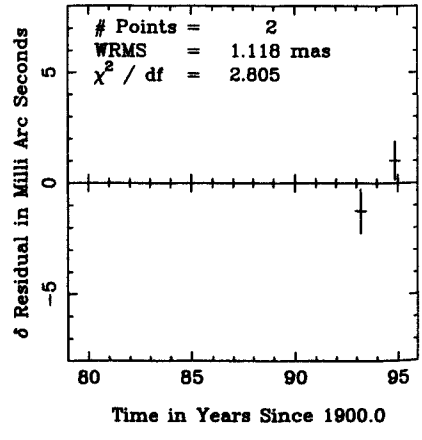
Arc Solution for 0500+019 : δ



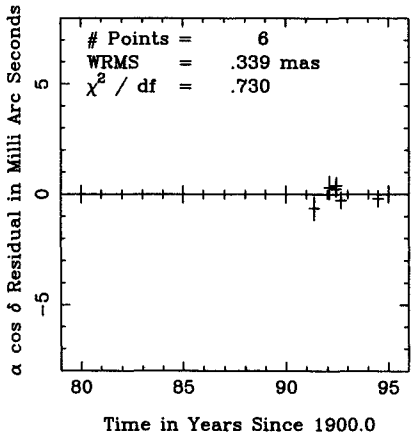
Arc Solution for 0502+049 : α cos δ



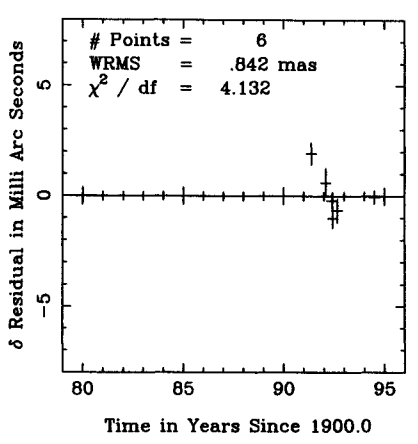
Arc Solution for 0502+049 : δ



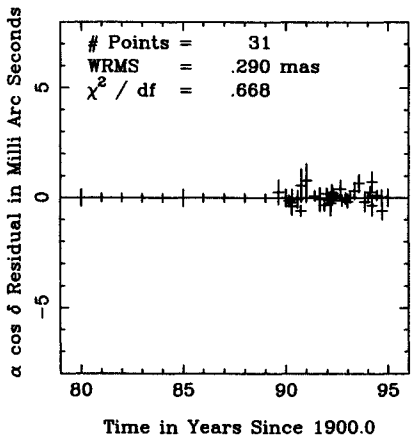
Arc Solution for 0506−612 : α cos δ



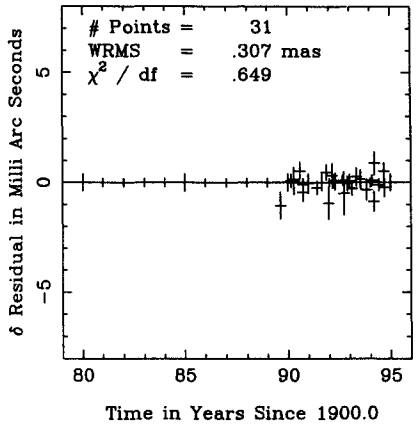
Arc Solution for 0506−612 : δ



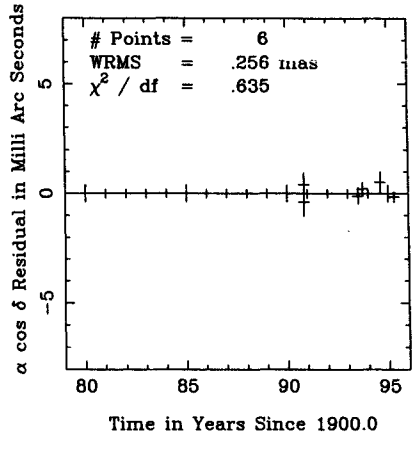
Arc Solution for 0454+844 : α cos δ



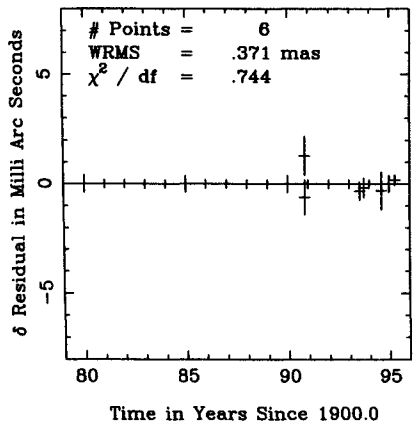
Arc Solution for 0454+844 : δ



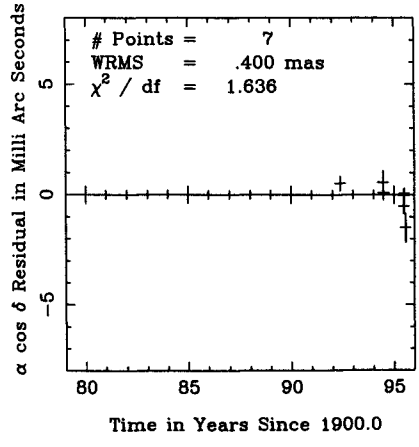
Arc Solution for 0507+179 : α cos δ



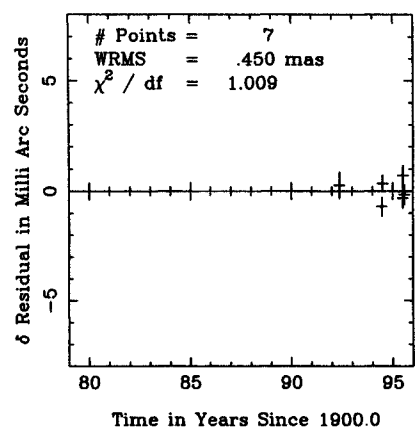
Arc Solution for 0507+179 : δ



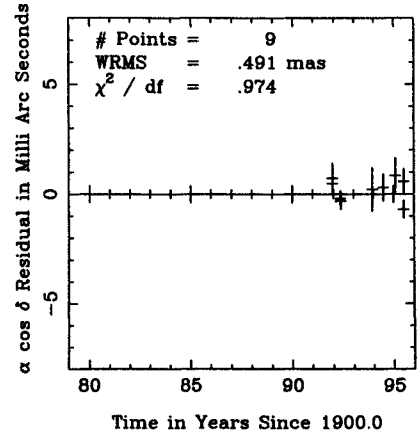
Arc Solution for 0516−621 : α cos δ



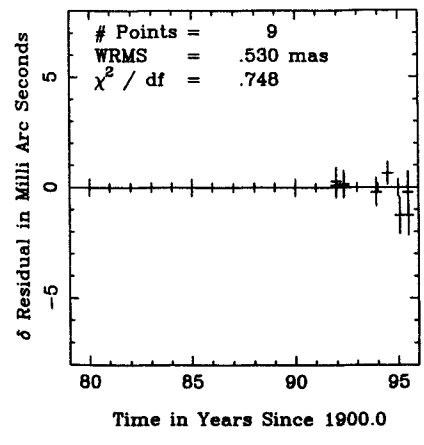
Arc Solution for 0516−621 : δ



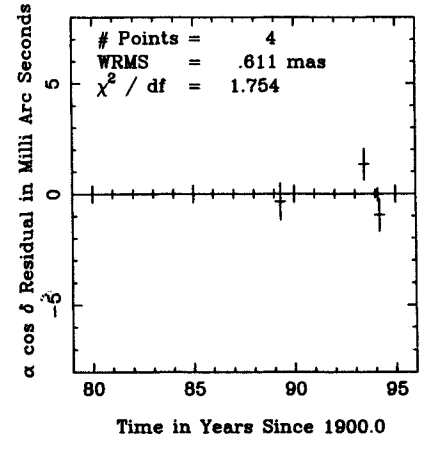
Arc Solution for 0530−727 : α cos δ



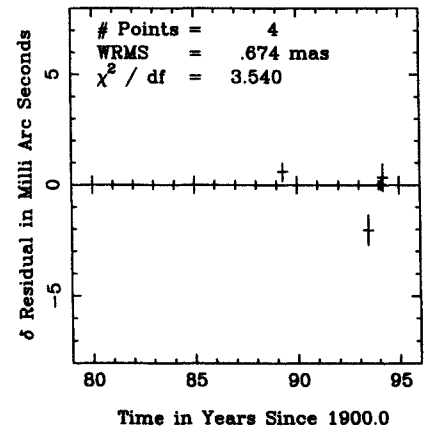
Arc Solution for 0530−727 : δ



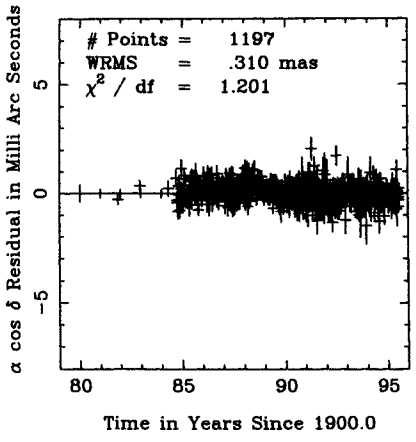
Arc Solution for 0528−250 : α cos δ



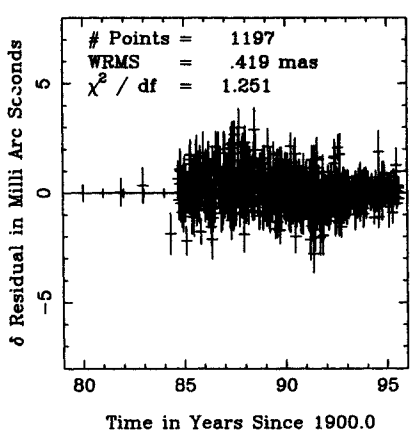
Arc Solution for 0528−250 : δ



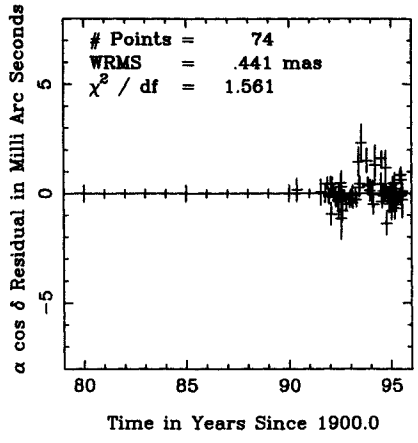
Arc Solution for 0528+134 : α cos δ



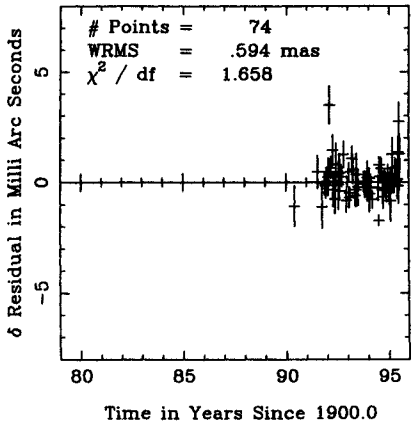
Arc Solution for 0528+134 : δ



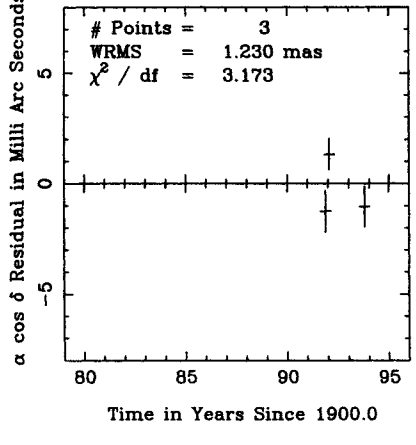
Arc Solution for 0537−441 : α cos δ



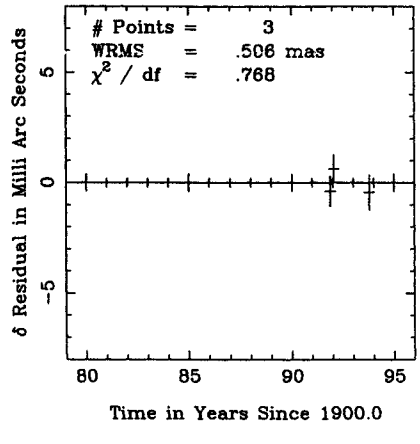
Arc Solution for 0537−441 : δ



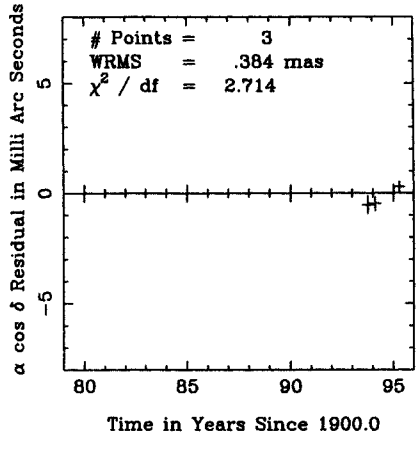
Arc Solution for 0537−286 : α cos δ



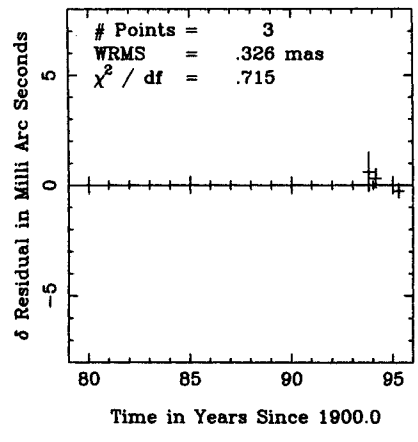
Arc Solution for 0537−286 : δ



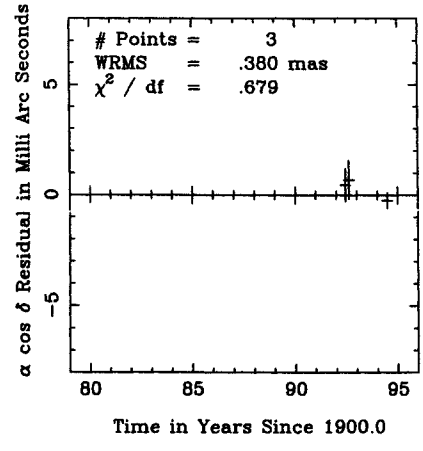
Arc Solution for 0539−057 : α cos δ



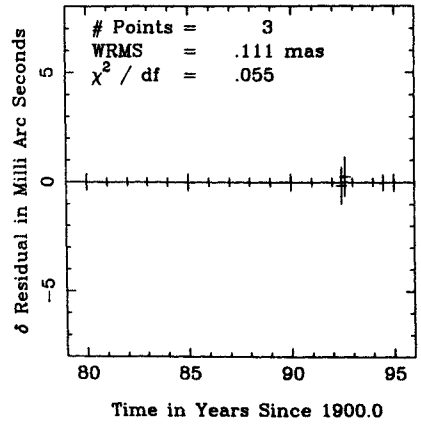
Arc Solution for 0539−057 : δ



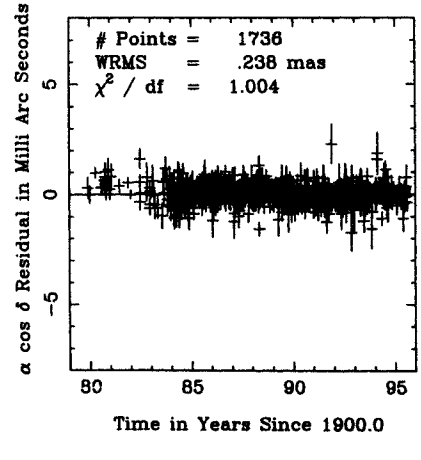
Arc Solution for 0538+498 : α cos δ



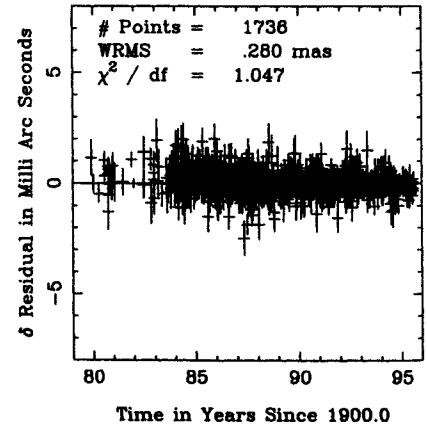
Arc Solution for 0538+498 : δ



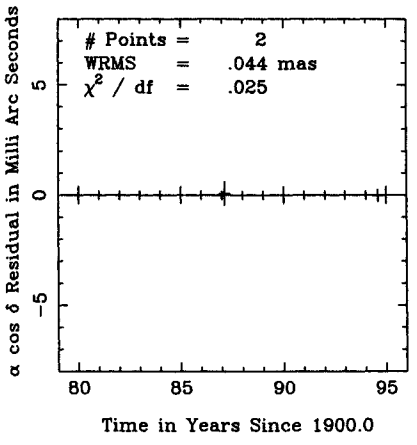
Arc Solution for 0552+398 : α cos δ



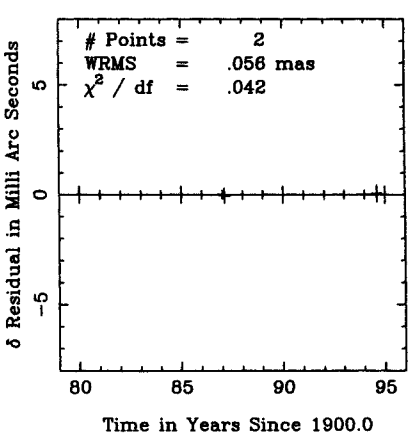
Arc Solution for 0552+398 : δ



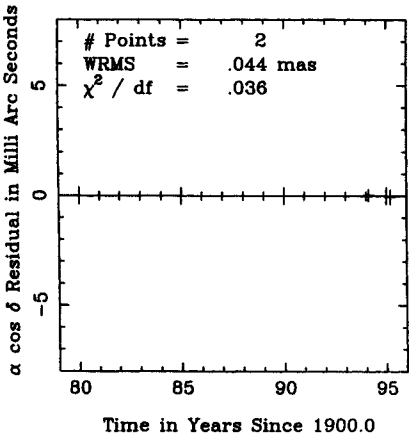
Arc Solution for 0605−085 : α cos δ



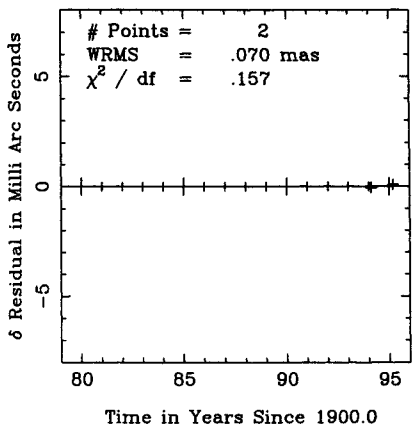
Arc Solution for 0605−085 : δ



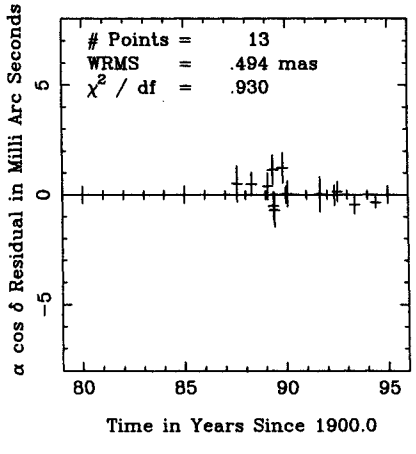
Arc Solution for 0607−157 : α cos δ



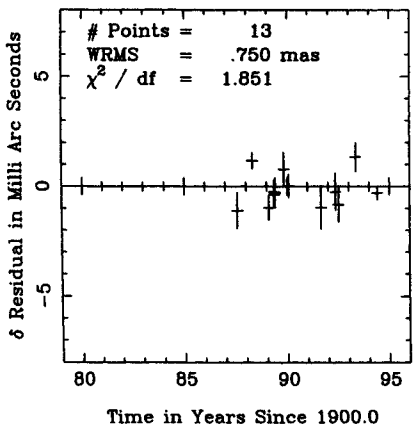
Arc Solution for 0607−157 : δ



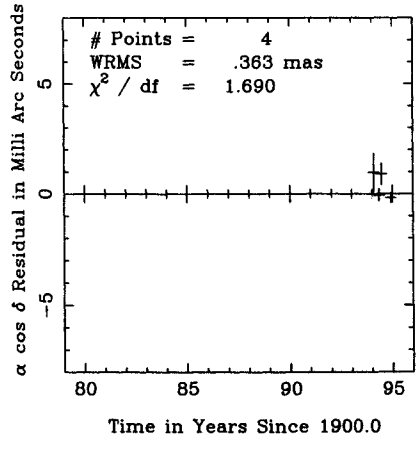
Arc Solution for 0609+607 : α cos δ



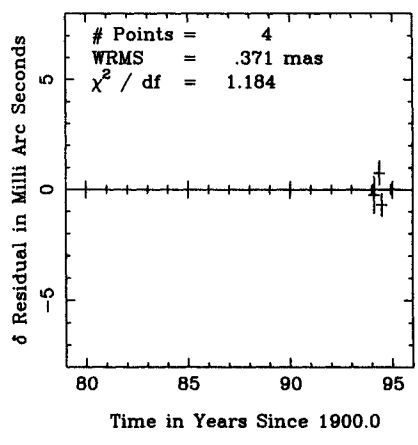
Arc Solution for 0609+607 : δ



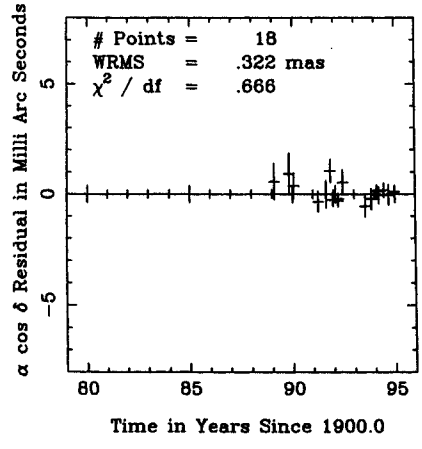
Arc Solution for 0620+389 : α cos δ



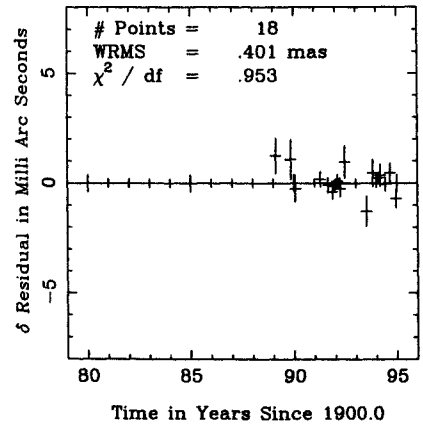
Arc Solution for 0620+389 : δ



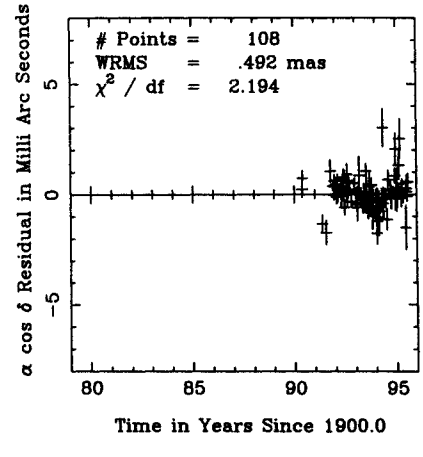
Arc Solution for 0615+820 : α cos δ



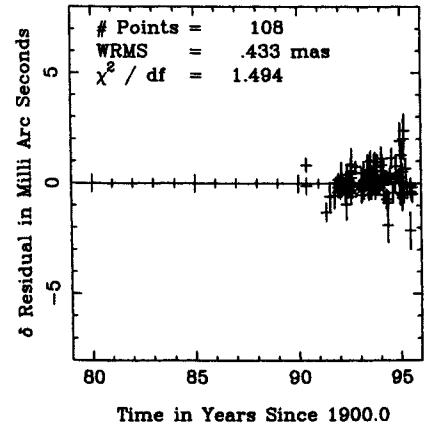
Arc Solution for 0615+820 : δ



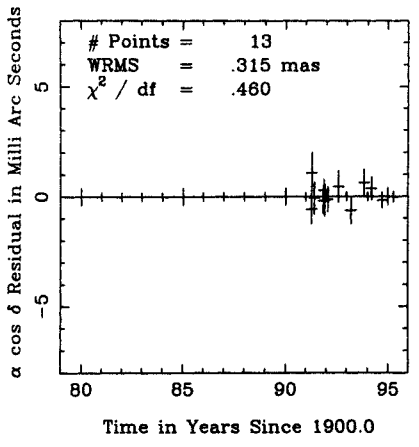
Arc Solution for 0637−752 : α cos δ



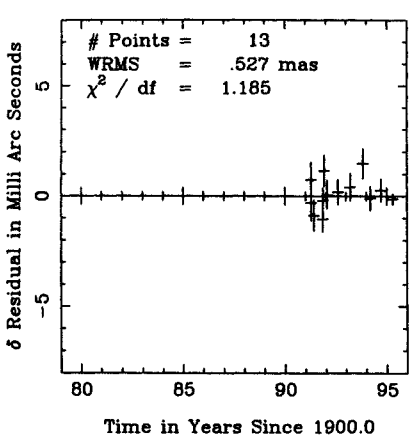
Arc Solution for 0637−752 : δ



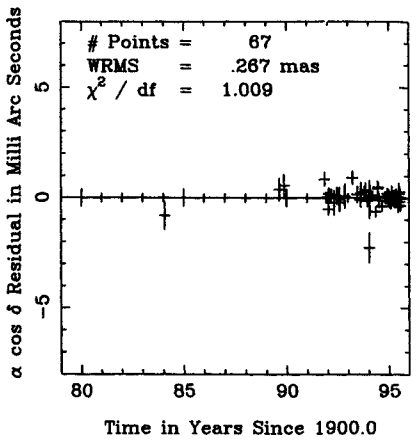
Arc Solution for 0636+680 : $\alpha \cos \delta$



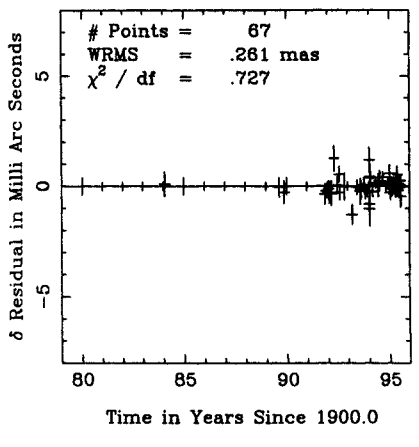
Arc Solution for 0636+680 : δ



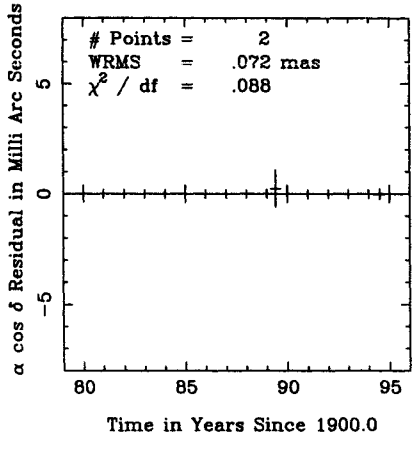
Arc Solution for 0642+449 : $\alpha \cos \delta$



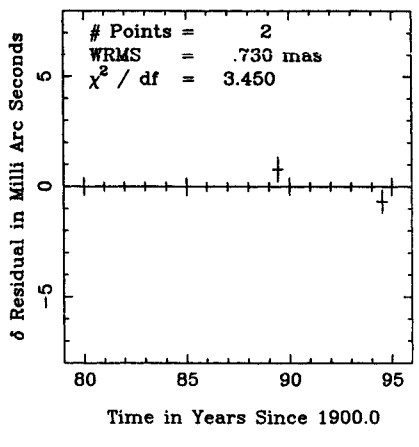
Arc Solution for 0642+449 : δ



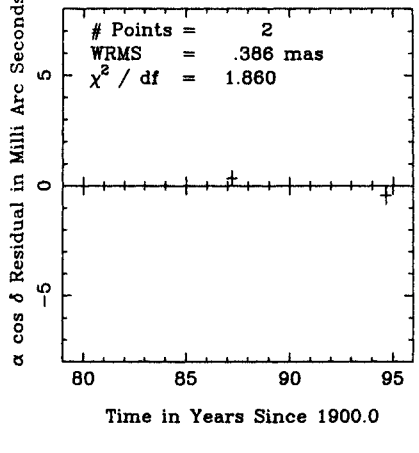
Arc Solution for 0646−306 : $\alpha \cos \delta$



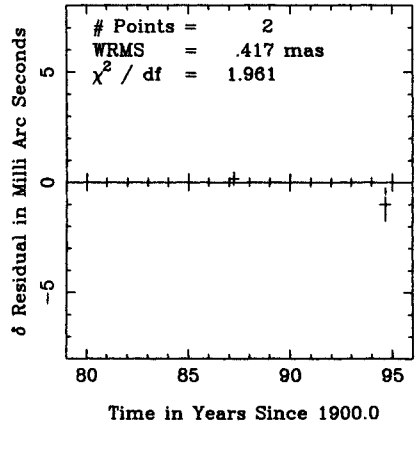
Arc Solution for 0646−306 : δ



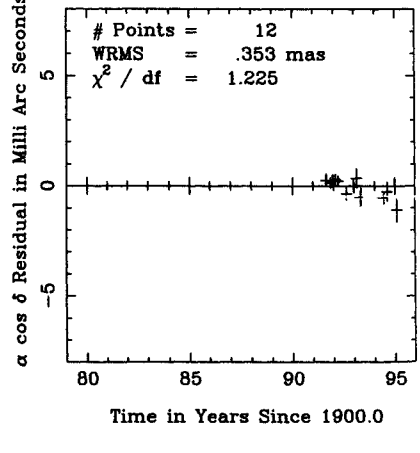
Arc Solution for 0648−165 : $\alpha \cos \delta$



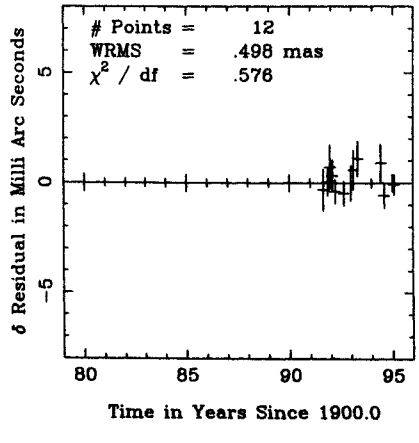
Arc Solution for 0648−165 : δ



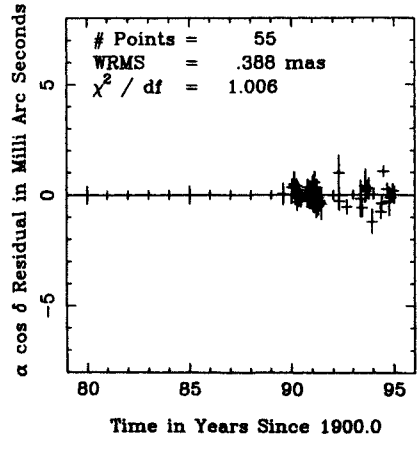
Arc Solution for 0650+371 : $\alpha \cos \delta$



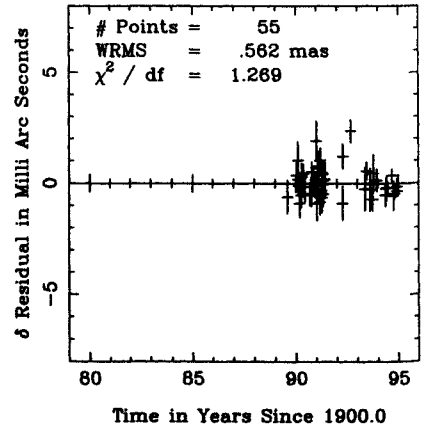
Arc Solution for 0650+371 : δ



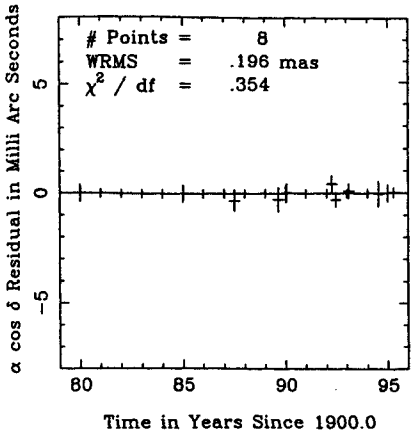
Arc Solution for 0657+172 : $\alpha \cos \delta$



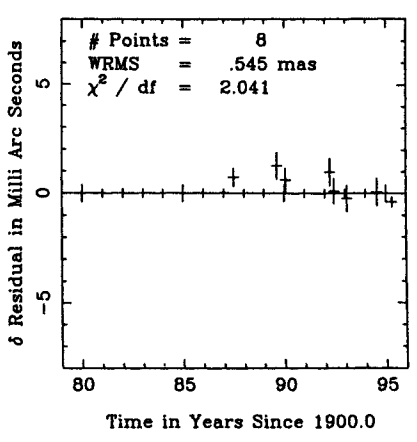
Arc Solution for 0657+172 : δ



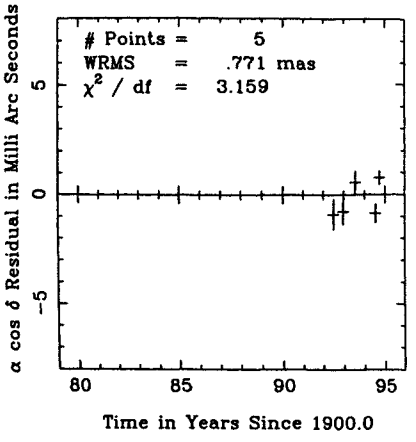
Arc Solution for 0707+476 : α cos δ



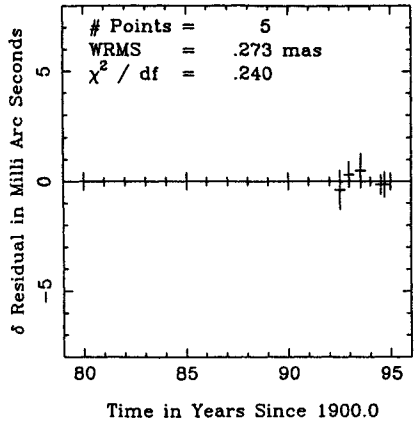
Arc Solution for 0707+476 : δ



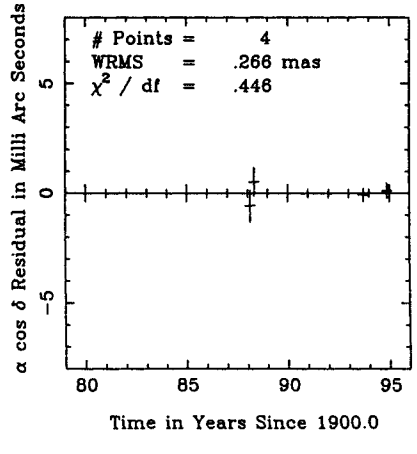
Arc Solution for 0710+439 : α cos δ



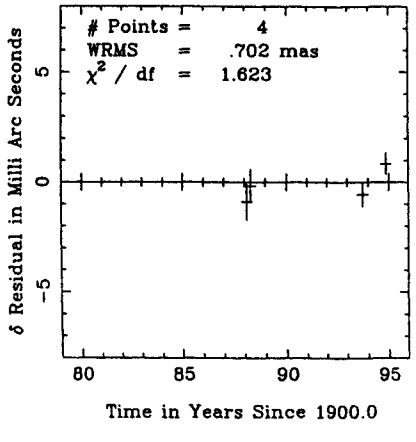
Arc Solution for 0710+439 : δ



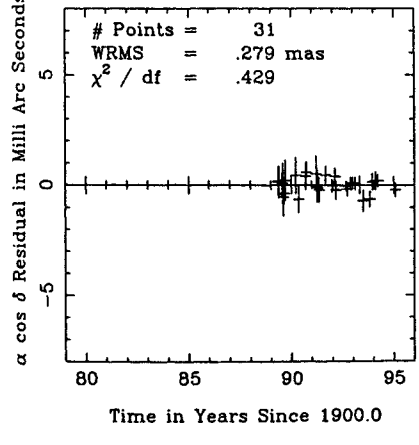
Arc Solution for 0711+356 : α cos δ



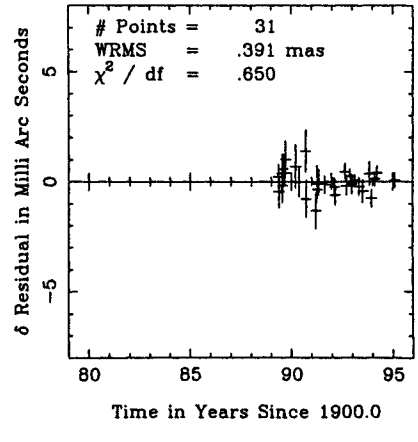
Arc Solution for 0711+356 : δ



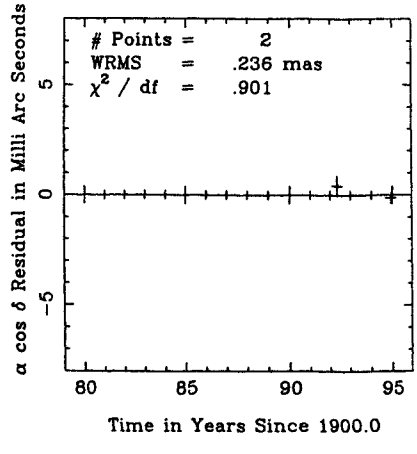
Arc Solution for 0716+714 : α cos δ



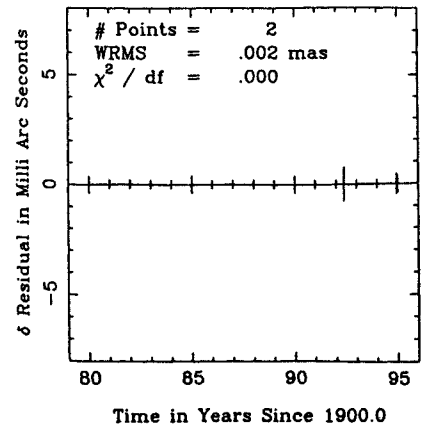
Arc Solution for 0716+714 : δ



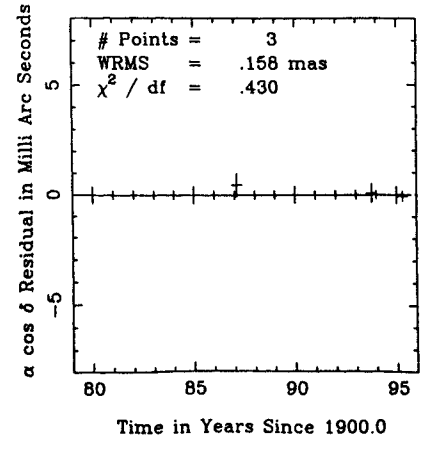
Arc Solution for 0722+145 : α cos δ



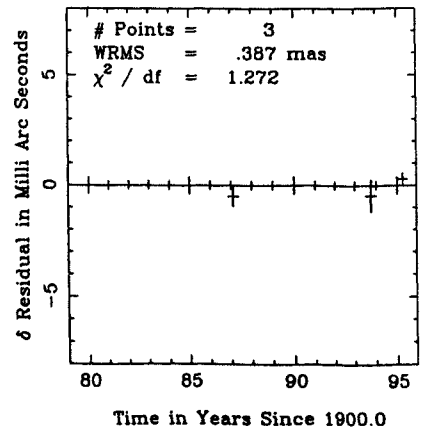
Arc Solution for 0722+145 : δ



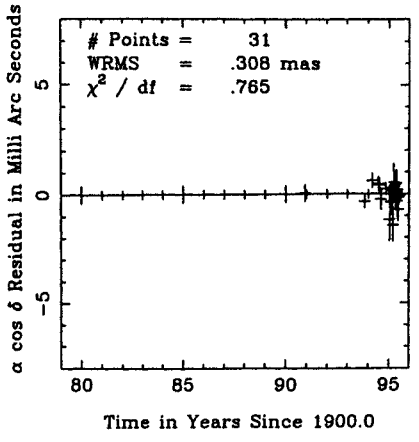
Arc Solution for 0723-008 : α cos δ



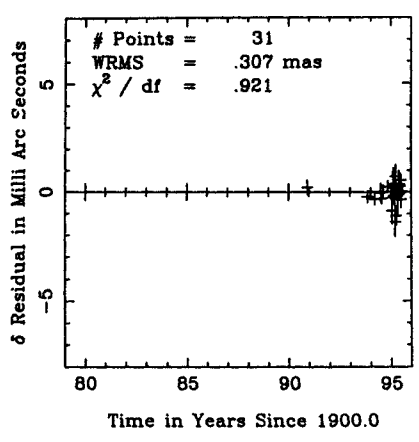
Arc Solution for 0723-008 : δ



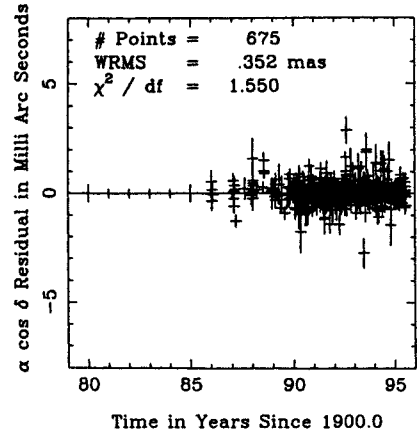
Arc Solution for 0718+792 : $\alpha \cos \delta$



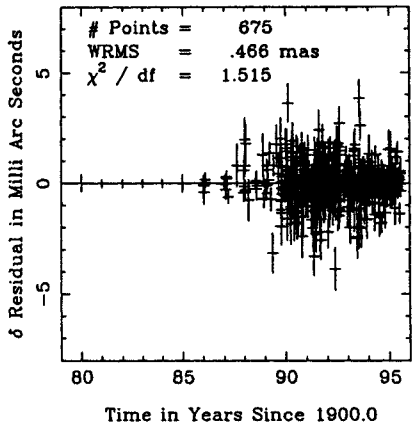
Arc Solution for 0718+792 : δ



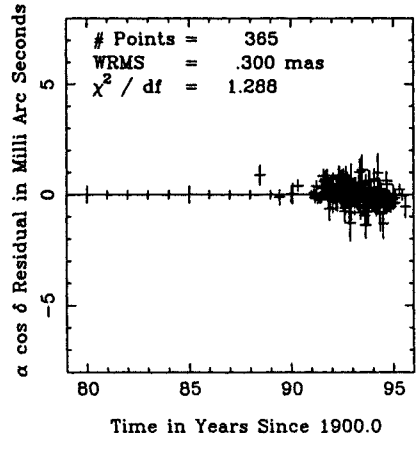
Arc Solution for 0727−115 : $\alpha \cos \delta$



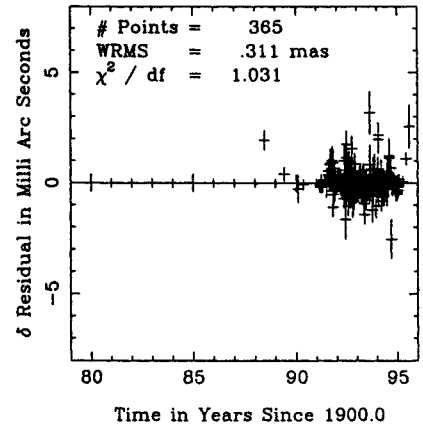
Arc Solution for 0727−115 : δ



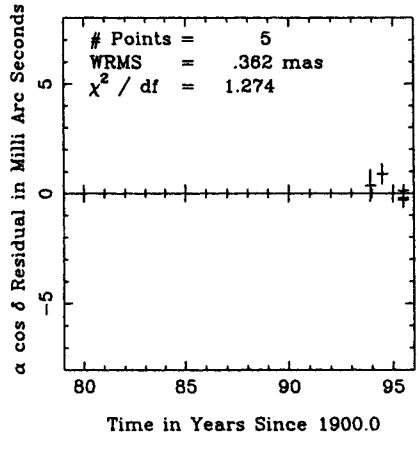
Arc Solution for 0735+178 : $\alpha \cos \delta$



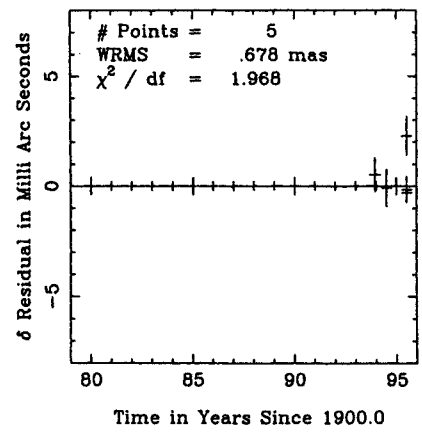
Arc Solution for 0735+178 : δ



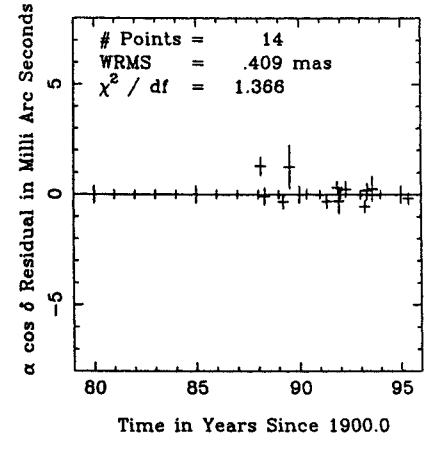
Arc Solution for 0738−674 : $\alpha \cos \delta$



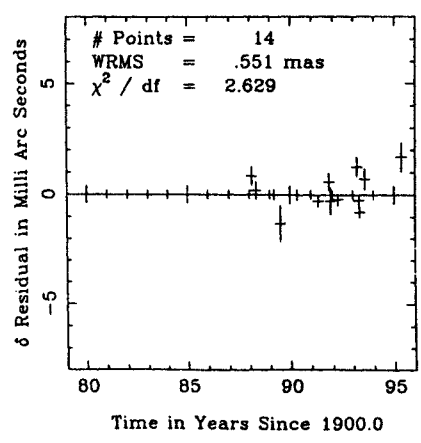
Arc Solution for 0738−674 : δ



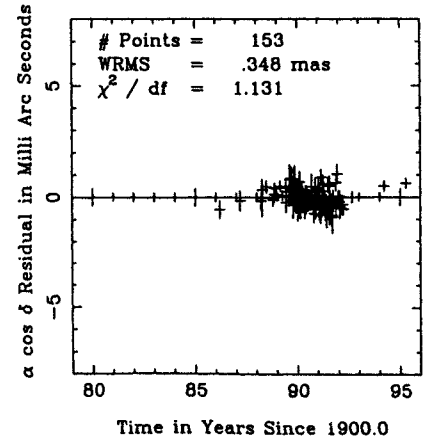
Arc Solution for 0738+313 : $\alpha \cos \delta$



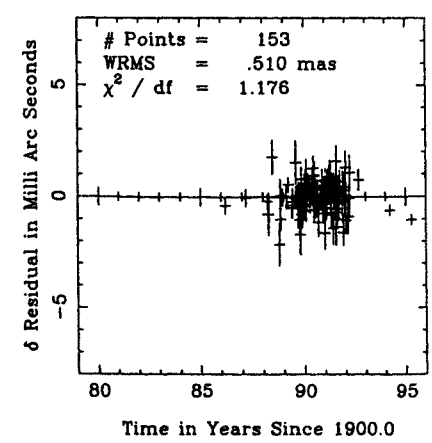
Arc Solution for 0738+313 : δ

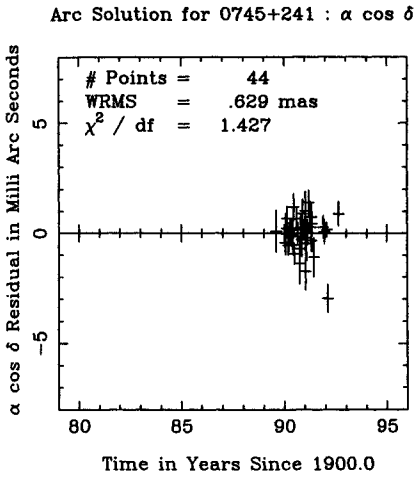


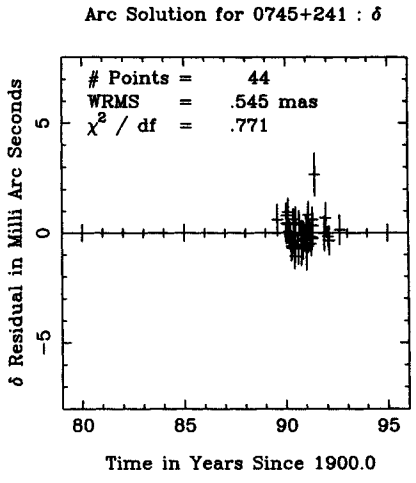
Arc Solution for 0742+103 : $\alpha \cos \delta$

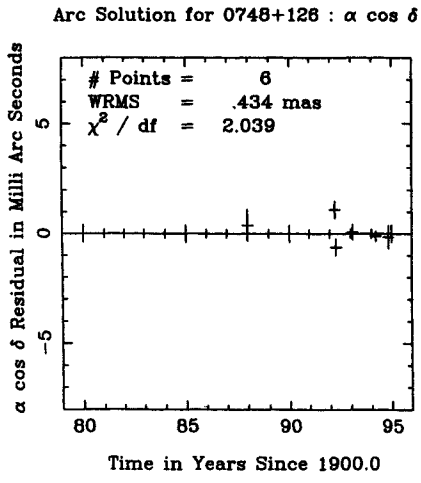


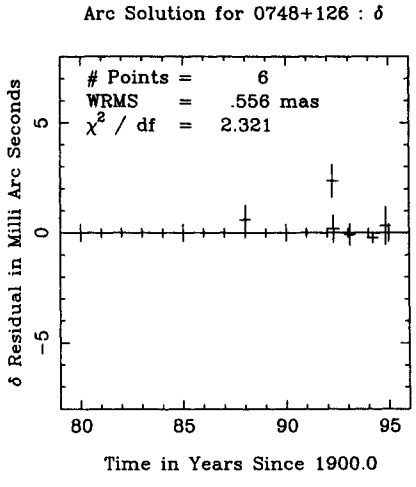
Arc Solution for 0742+103 : δ

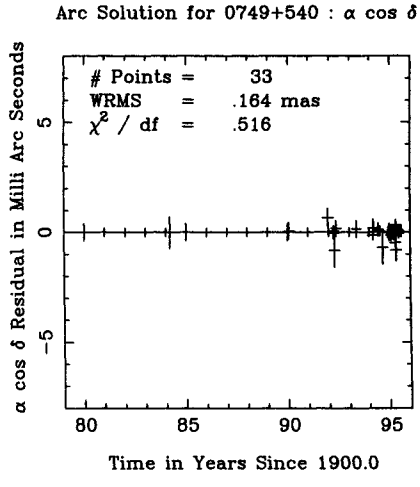


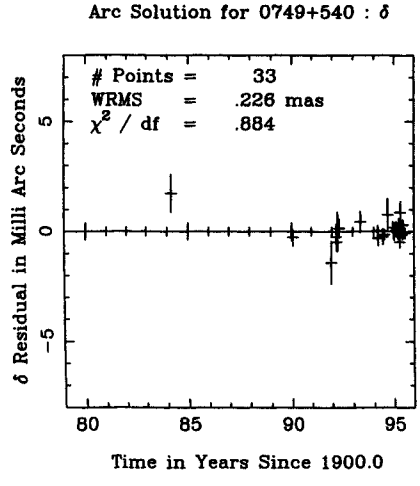

Arc Solution for 0745+241 : α cos δ
# Points = 44
WRMS = .629 mas
χ² / df = 1.427
α cos δ Residual in Milli Arc Seconds
Time in Years Since 1900.0

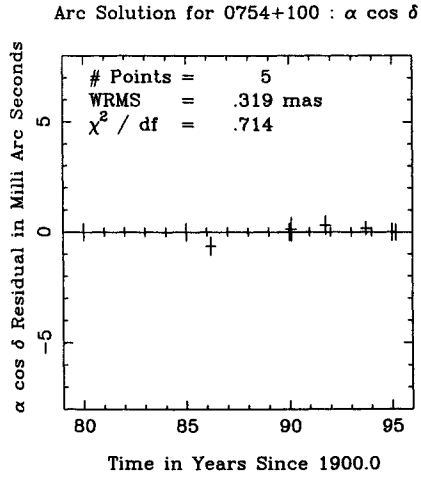

Arc Solution for 0745+241 : δ
# Points = 44
WRMS = .545 mas
χ² / df = .771
δ Residual in Milli Arc Seconds
Time in Years Since 1900.0

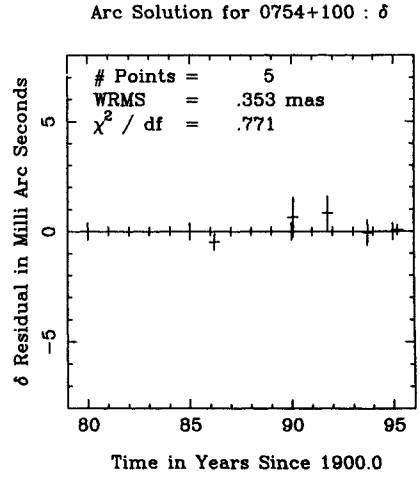

Arc Solution for 0748+126 : α cos δ
# Points = 6
WRMS = .434 mas
χ² / df = 2.039
α cos δ Residual in Milli Arc Seconds
Time in Years Since 1900.0

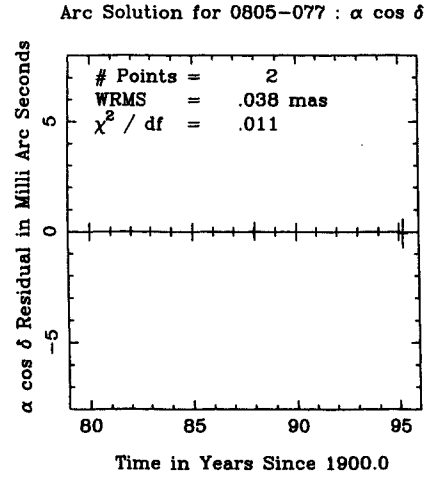

Arc Solution for 0748+126 : δ
# Points = 6
WRMS = .556 mas
χ² / df = 2.321
δ Residual in Milli Arc Seconds
Time in Years Since 1900.0

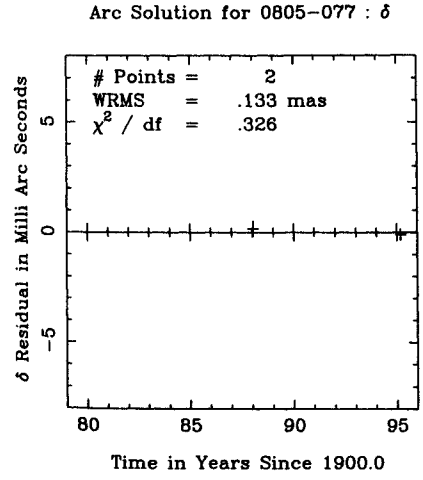

Arc Solution for 0749+540 : α cos δ
# Points = 33
WRMS = .164 mas
χ² / df = .516
α cos δ Residual in Milli Arc Seconds
Time in Years Since 1900.0

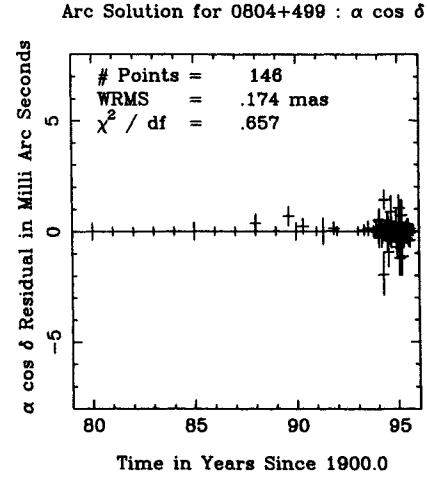

Arc Solution for 0749+540 : δ
# Points = 33
WRMS = .226 mas
χ² / df = .884
δ Residual in Milli Arc Seconds
Time in Years Since 1900.0

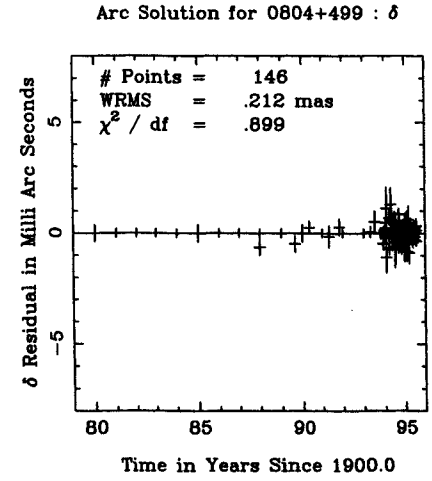

Arc Solution for 0754+100 : α cos δ
# Points = 5
WRMS = .319 mas
χ² / df = .714
α cos δ Residual in Milli Arc Seconds
Time in Years Since 1900.0


Arc Solution for 0754+100 : δ
# Points = 5
WRMS = .353 mas
χ² / df = .771
δ Residual in Milli Arc Seconds
Time in Years Since 1900.0

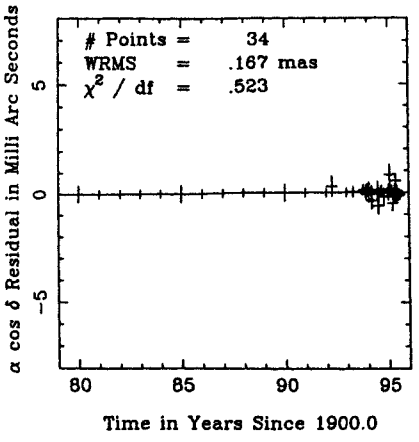

Arc Solution for 0805−077 : α cos δ
# Points = 2
WRMS = .038 mas
χ² / df = .011
α cos δ Residual in Milli Arc Seconds
Time in Years Since 1900.0


Arc Solution for 0805−077 : δ
# Points = 2
WRMS = .133 mas
χ² / df = .326
δ Residual in Milli Arc Seconds
Time in Years Since 1900.0

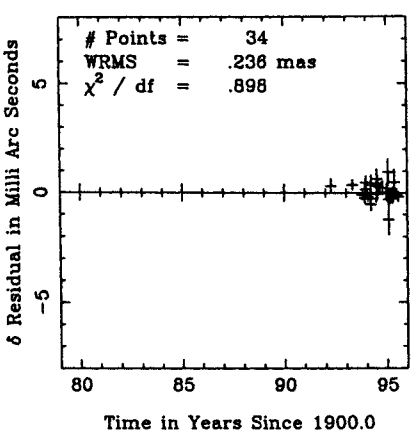

Arc Solution for 0804+499 : α cos δ
# Points = 146
WRMS = .174 mas
χ² / df = .657
α cos δ Residual in Milli Arc Seconds
Time in Years Since 1900.0


Arc Solution for 0804+499 : δ
# Points = 146
WRMS = .212 mas
χ² / df = .899
δ Residual in Milli Arc Seconds
Time in Years Since 1900.0

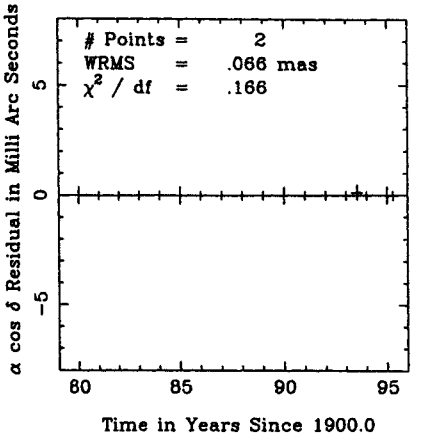
Arc Solution for 0805+410 : $\alpha \cos \delta$



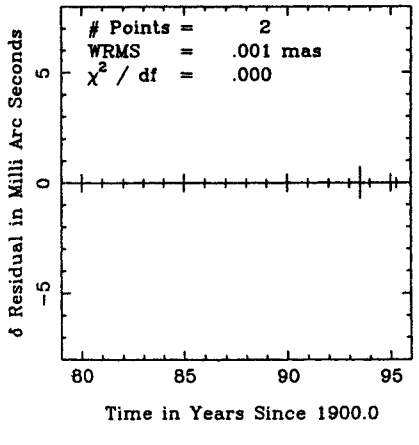
Arc Solution for 0805+410 : δ



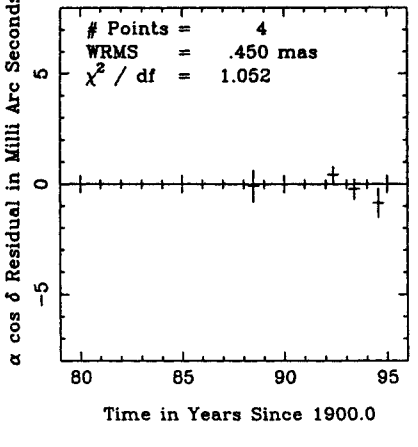
Arc Solution for 0808+019 : $\alpha \cos \delta$



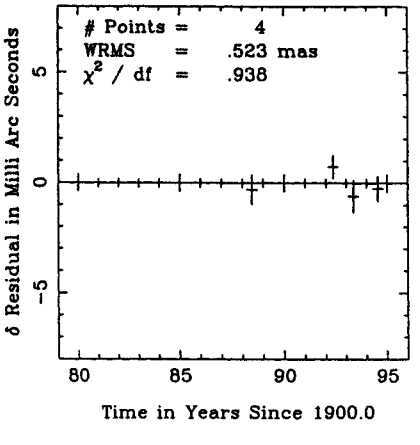
Arc Solution for 0808+019 : δ



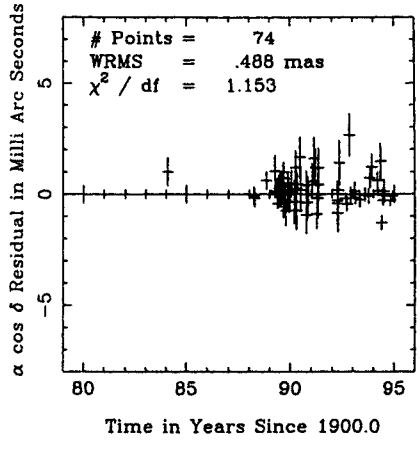
Arc Solution for 0812+367 : $\alpha \cos \delta$



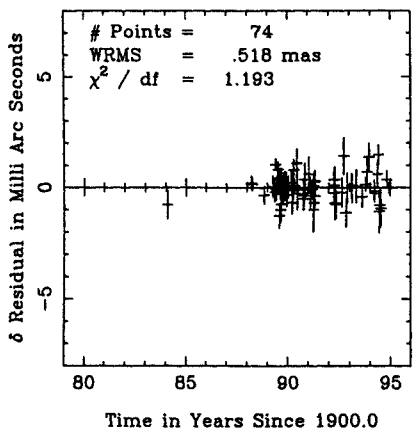
Arc Solution for 0812+367 : δ



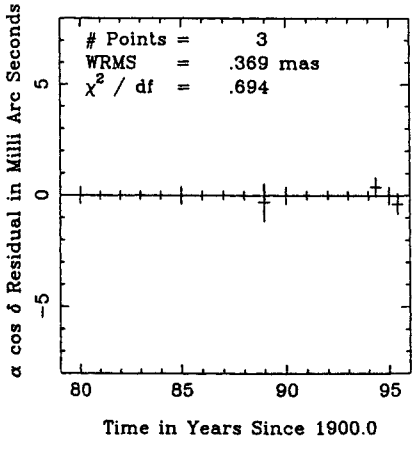
Arc Solution for 0814+425 : $\alpha \cos \delta$



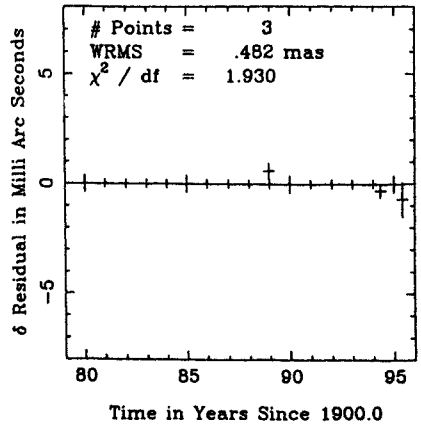
Arc Solution for 0814+425 : δ



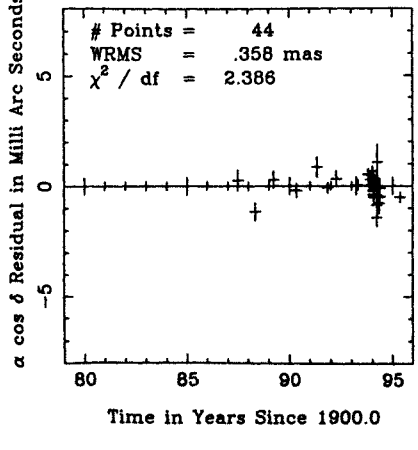
Arc Solution for 0818−128 : $\alpha \cos \delta$



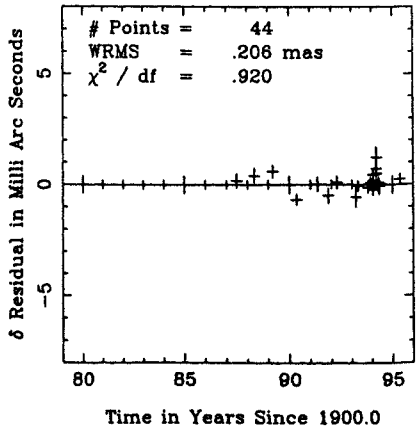
Arc Solution for 0818−128 : δ



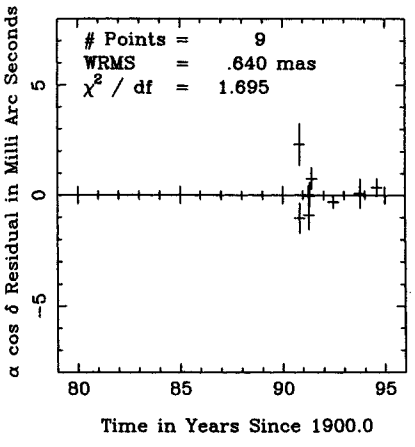
Arc Solution for 0820+560 : $\alpha \cos \delta$



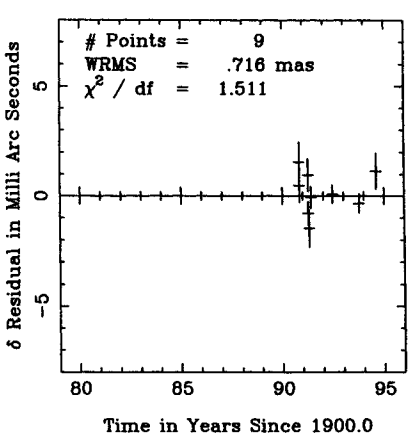
Arc Solution for 0820+560 : δ



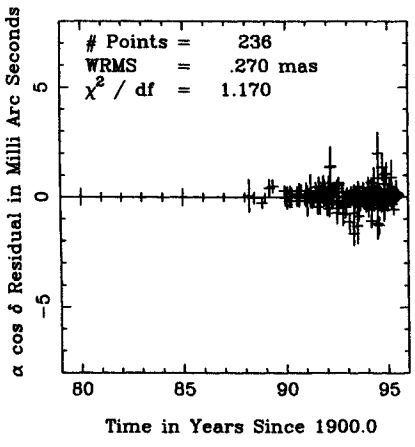
Arc Solution for 0821+394 : $\alpha \cos \delta$



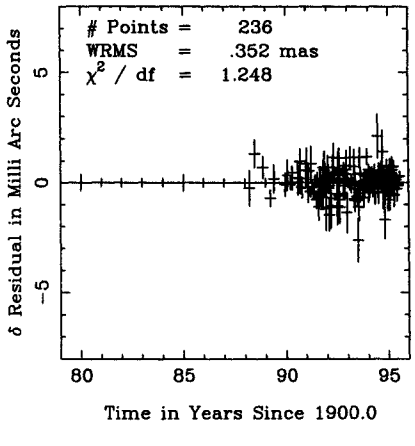
Arc Solution for 0821+394 : δ



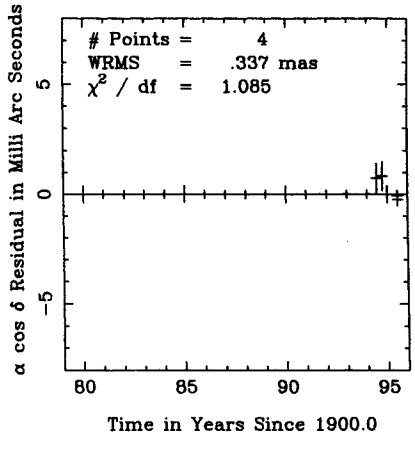
Arc Solution for 0823+033 : $\alpha \cos \delta$



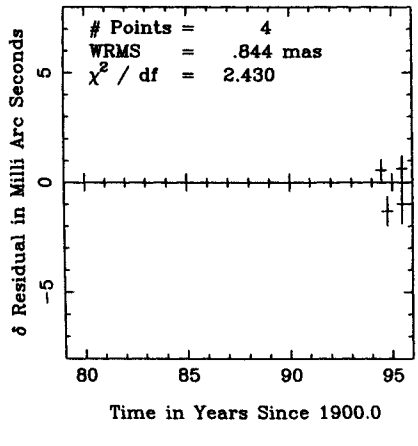
Arc Solution for 0823+033 : δ



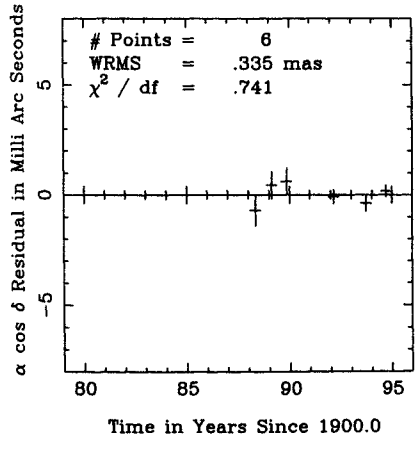
Arc Solution for 0826−373 : $\alpha \cos \delta$



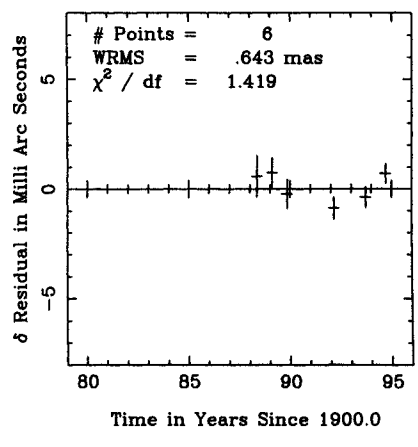
Arc Solution for 0826−373 : δ



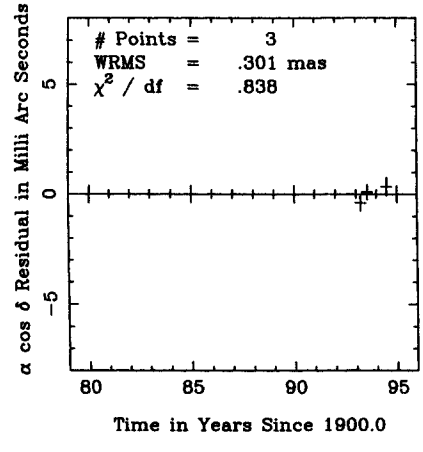
Arc Solution for 0827+243 : $\alpha \cos \delta$



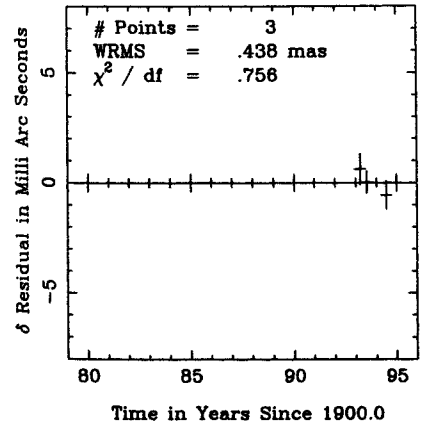
Arc Solution for 0827+243 : δ



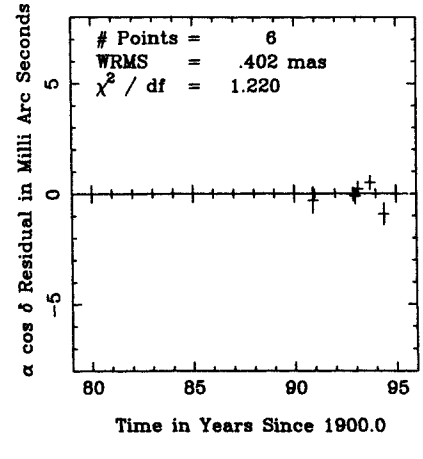
Arc Solution for 0829+046 : $\alpha \cos \delta$



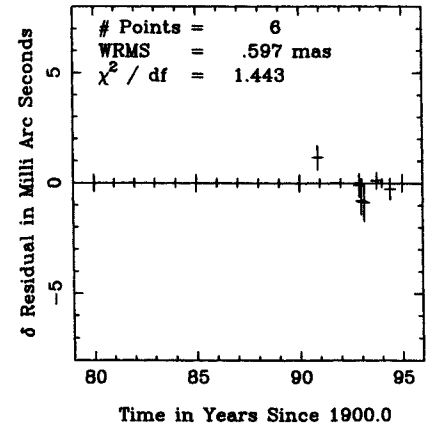
Arc Solution for 0829+046 : δ



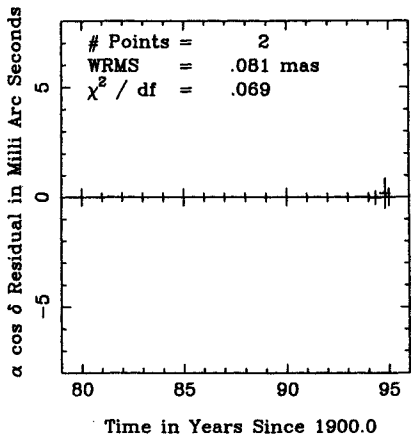
Arc Solution for 0828+493 : $\alpha \cos \delta$



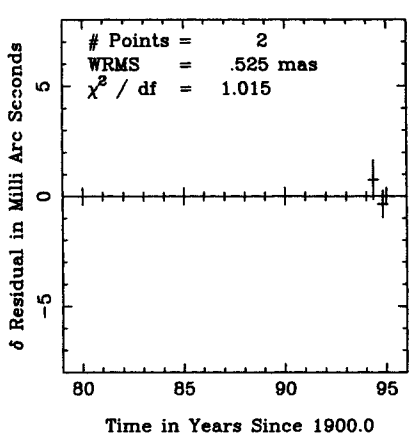
Arc Solution for 0828+493 : δ



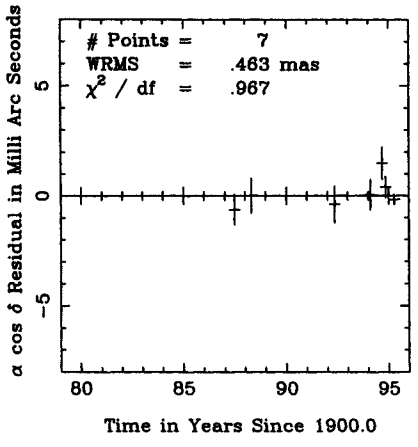
Arc Solution for 0834−201 : α cos δ



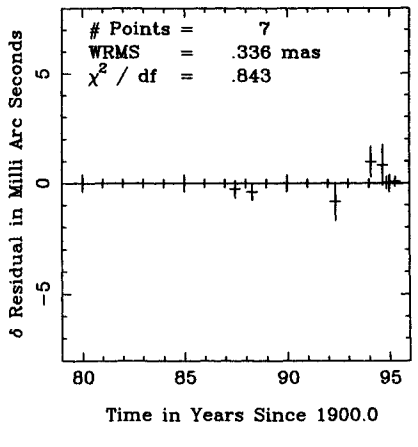
Arc Solution for 0834−201 : δ



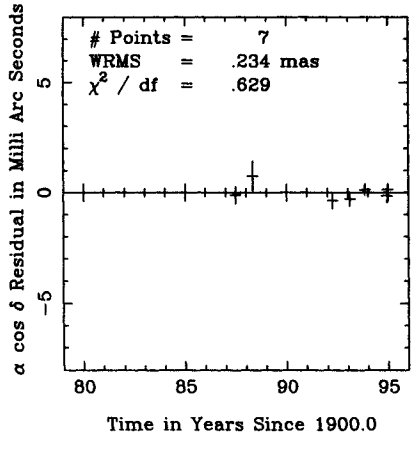
Arc Solution for 0833+585 : α cos δ



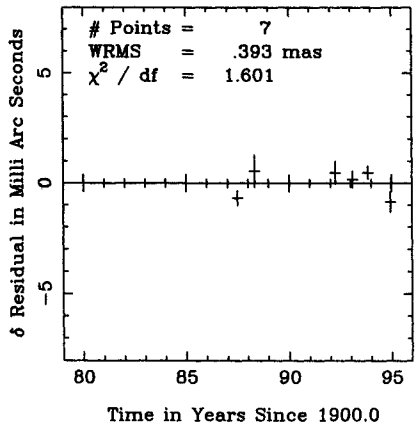
Arc Solution for 0833+585 : δ



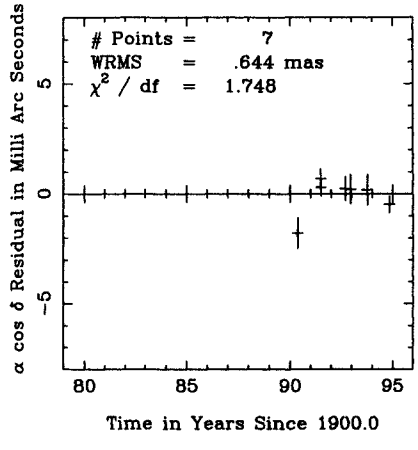
Arc Solution for 0836+710 : α cos δ



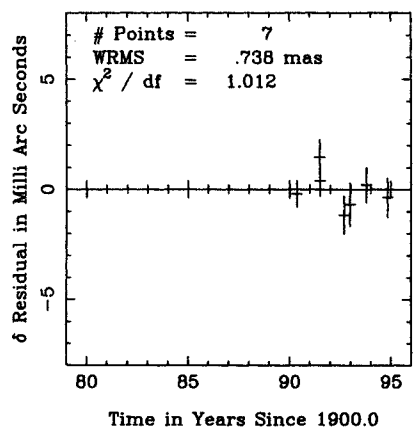
Arc Solution for 0836+710 : δ



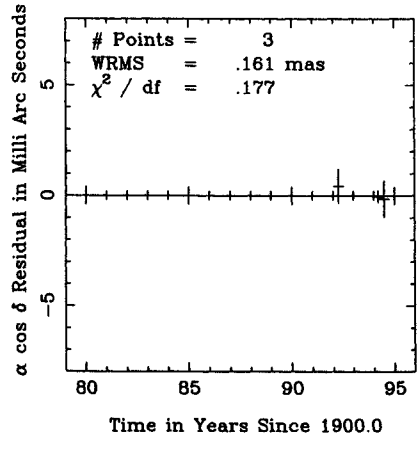
Arc Solution for 0839+187 : α cos δ



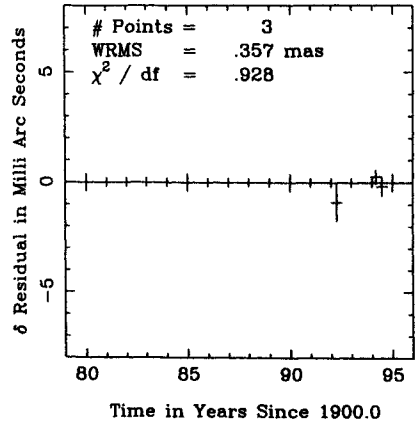
Arc Solution for 0839+187 : δ



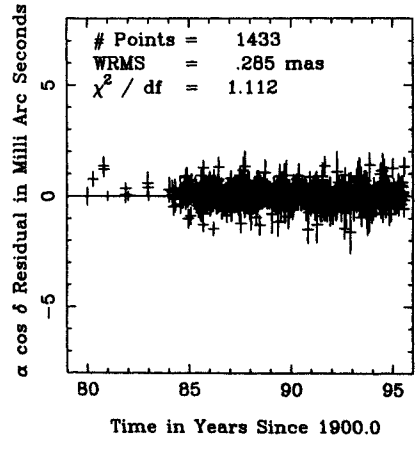
Arc Solution for 0850+581 : α cos δ



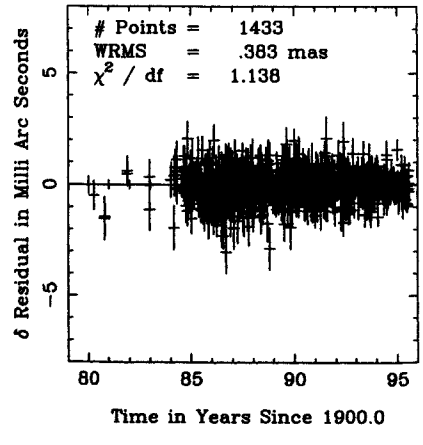
Arc Solution for 0850+581 : δ



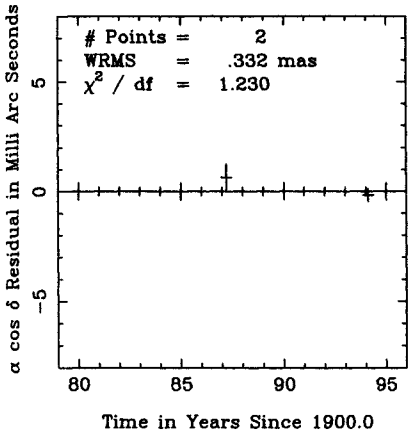
Arc Solution for 0851+202 : α cos δ



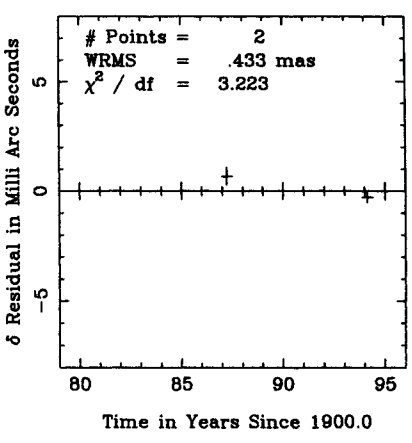
Arc Solution for 0851+202 : δ



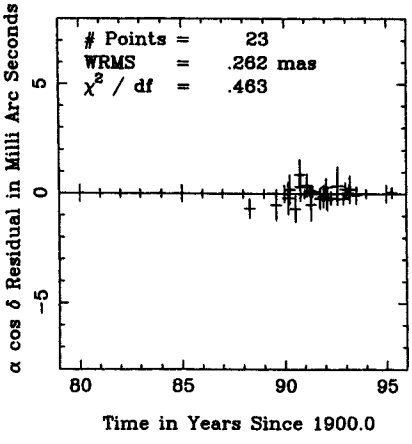
Arc Solution for 0859−140 : α cos δ



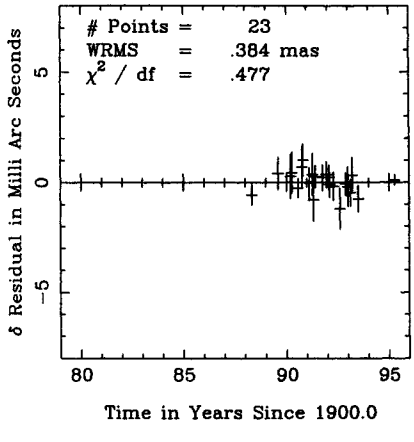
Arc Solution for 0859−140 : δ



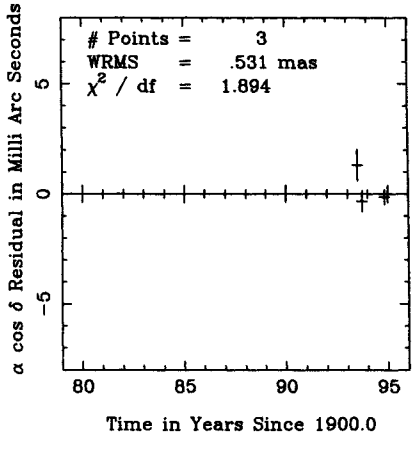
Arc Solution for 0859+470 : α cos δ



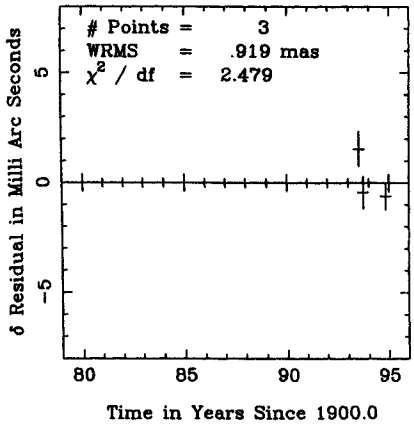
Arc Solution for 0859+470 : δ



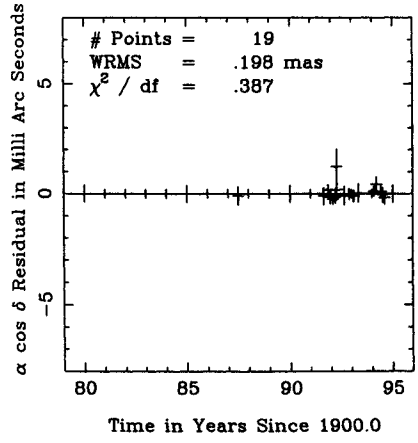
Arc Solution for 0912+297 : α cos δ



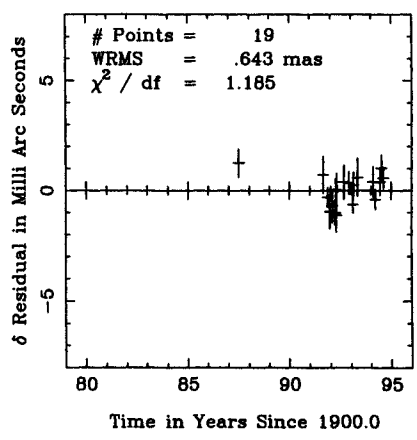
Arc Solution for 0912+297 : δ



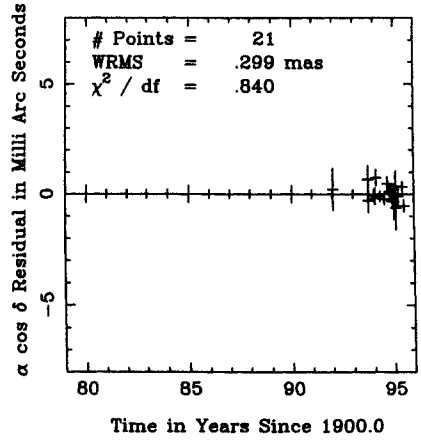
Arc Solution for 0917+449 : α cos δ



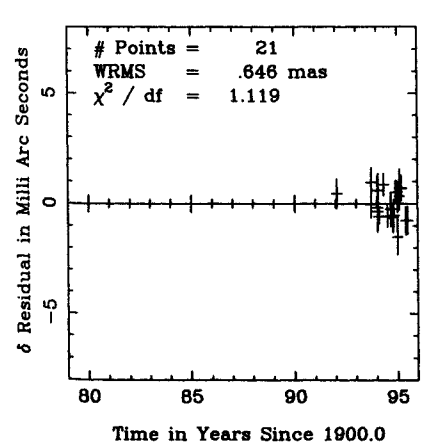
Arc Solution for 0917+449 : δ



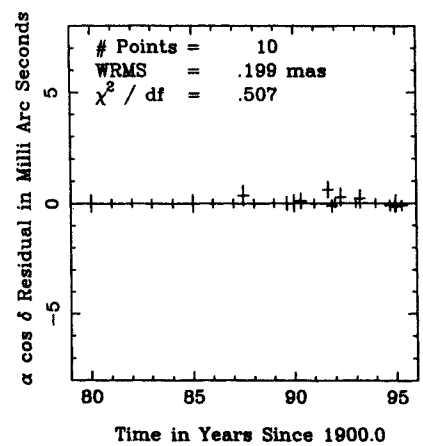
Arc Solution for 0919−260 : α cos δ



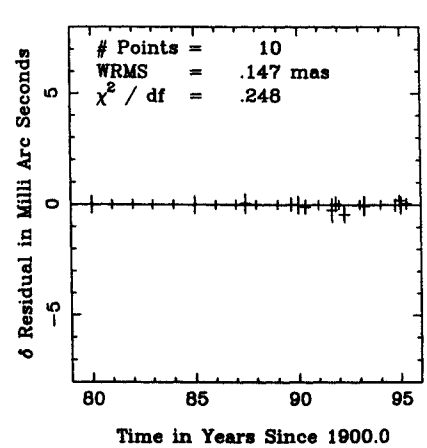
Arc Solution for 0919−260 : δ



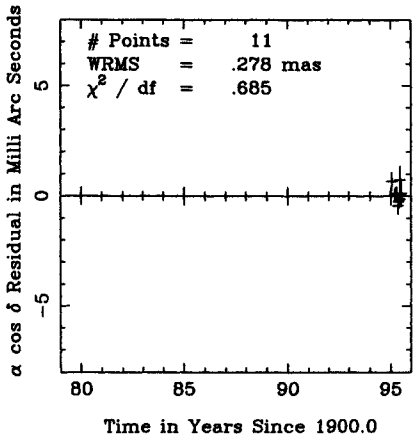
Arc Solution for 0917+624 : α cos δ



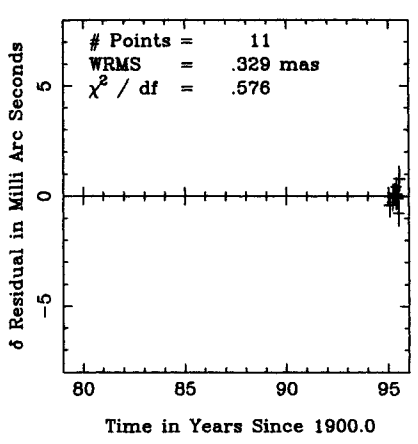
Arc Solution for 0917+624 : δ



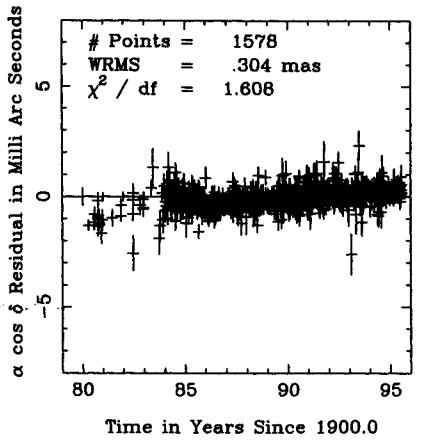
Arc Solution for 0920+390 : α cos δ



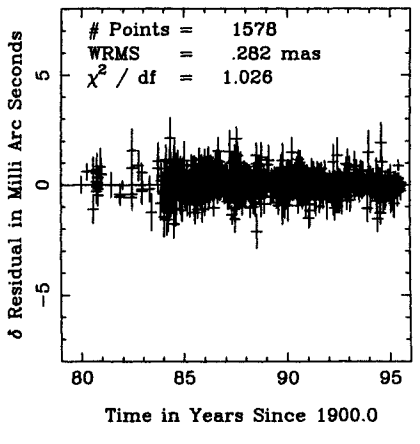
Arc Solution for 0920+390 : δ



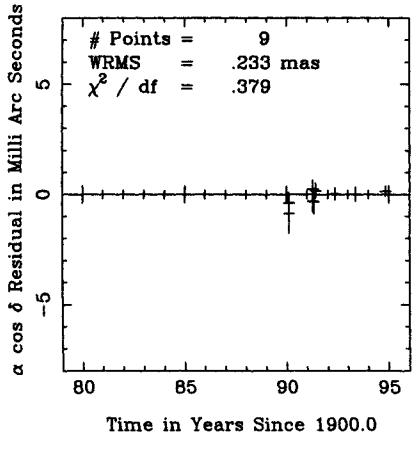
Arc Solution for 0923+392 : α cos δ



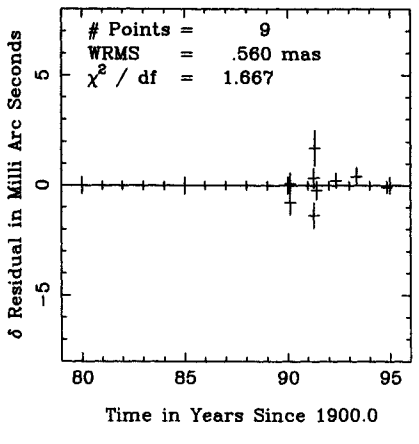
Arc Solution for 0923+392 : δ



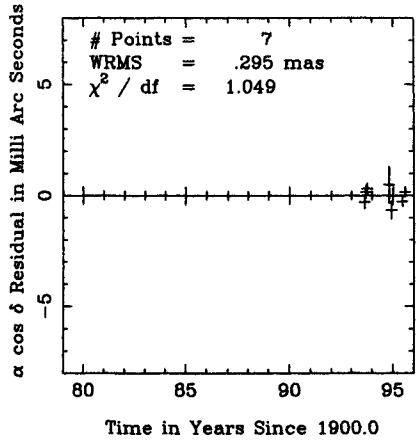
Arc Solution for 0945+408 : α cos δ



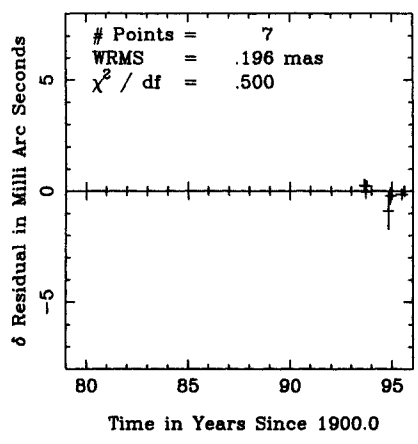
Arc Solution for 0945+408 : δ



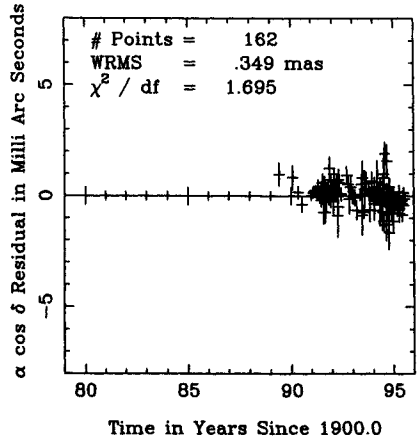
Arc Solution for 0951+693 : α cos δ



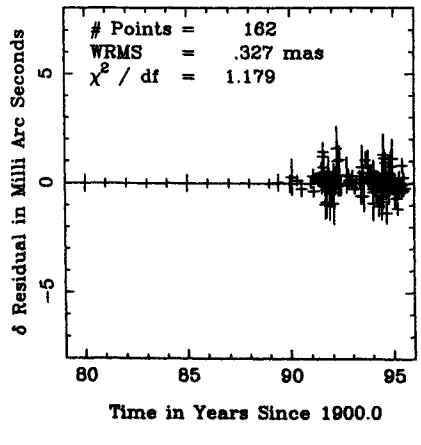
Arc Solution for 0951+693 : δ



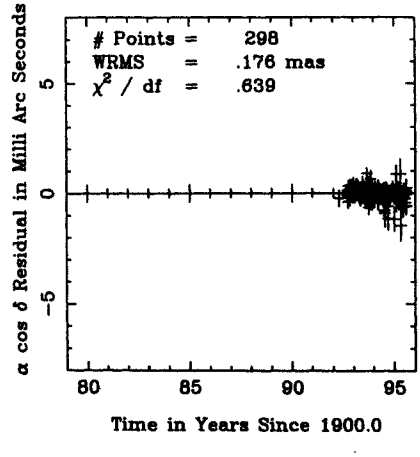
Arc Solution for 0953+254 : α cos δ



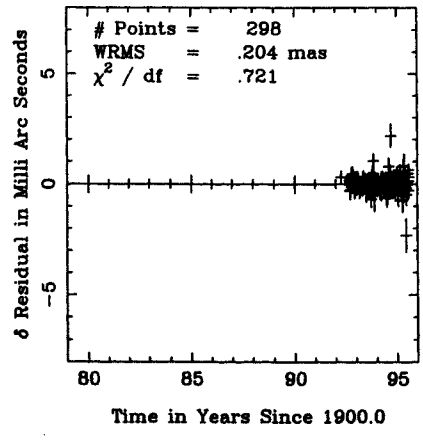
Arc Solution for 0953+254 : δ



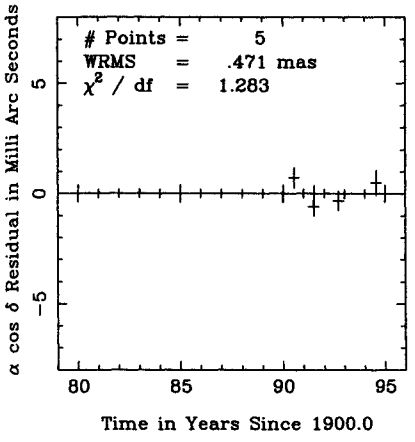
Arc Solution for 0955+476 : α cos δ



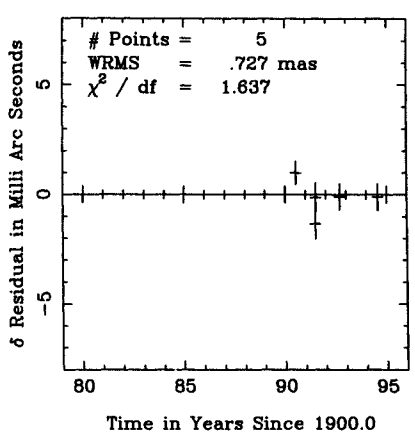
Arc Solution for 0955+476 : δ



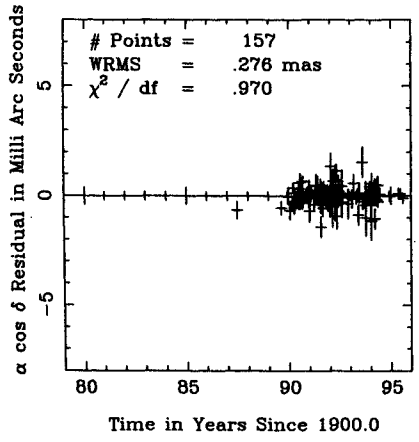
Arc Solution for 0955+326 : α cos δ



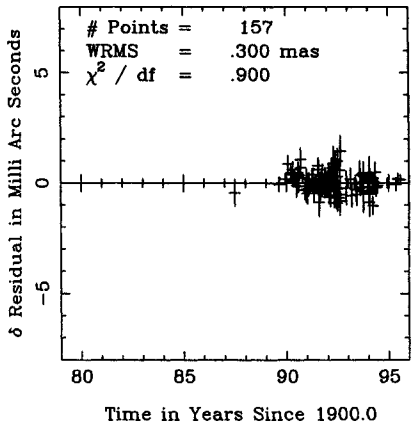
Arc Solution for 0955+326 : δ



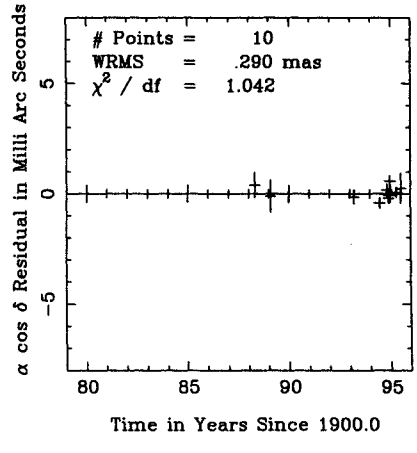
Arc Solution for 0954+658 : α cos δ



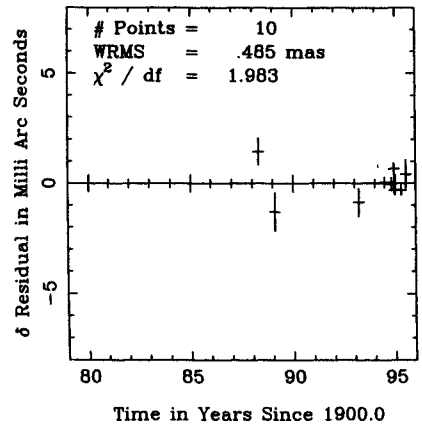
Arc Solution for 0954+658 : δ



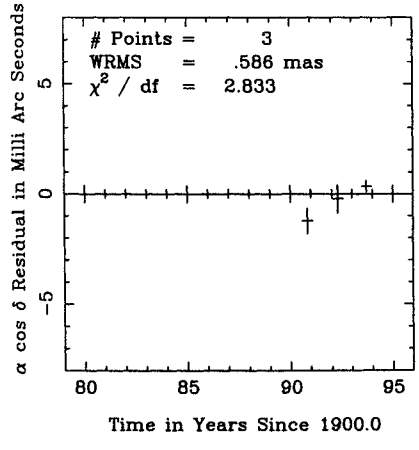
Arc Solution for 1004+141 : α cos δ



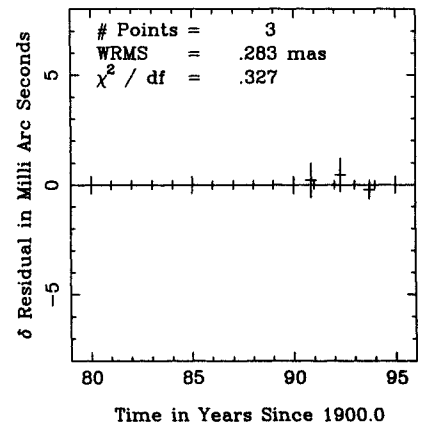
Arc Solution for 1004+141 : δ



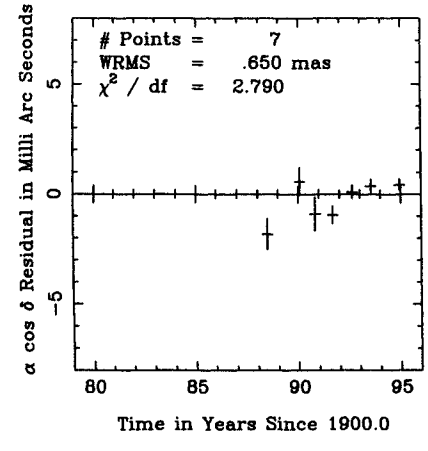
Arc Solution for 1012+232 : α cos δ



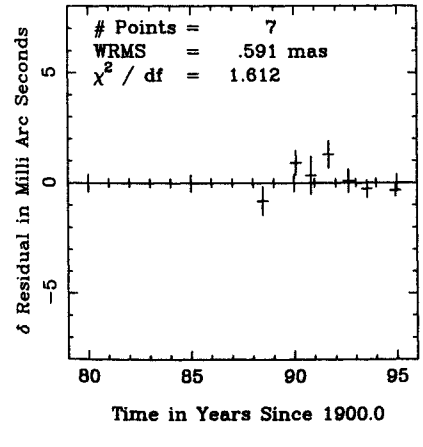
Arc Solution for 1012+232 : δ



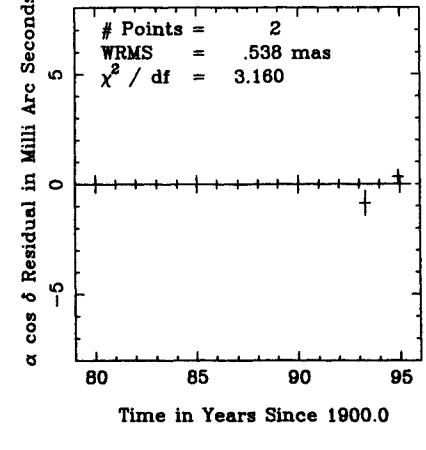
Arc Solution for 1020+400 : α cos δ



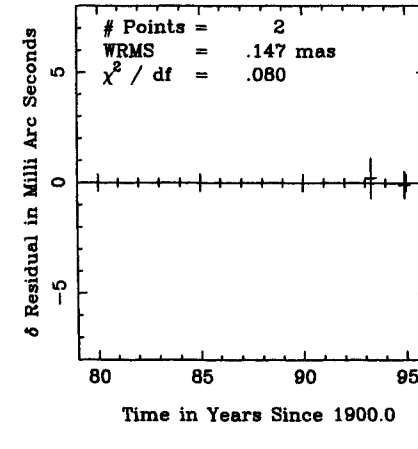
Arc Solution for 1020+400 : δ



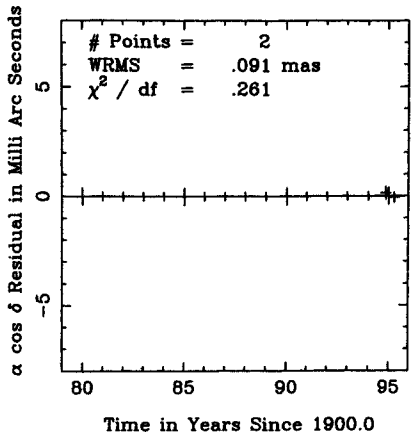
Arc Solution for 1021−006 : α cos δ



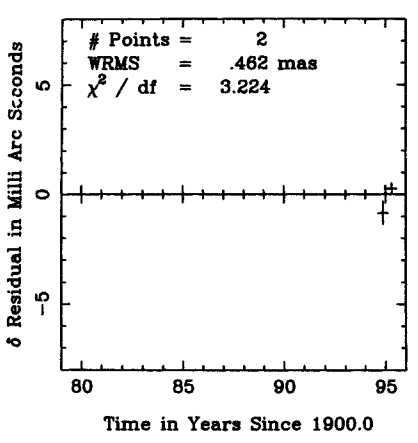
Arc Solution for 1021−006 : δ



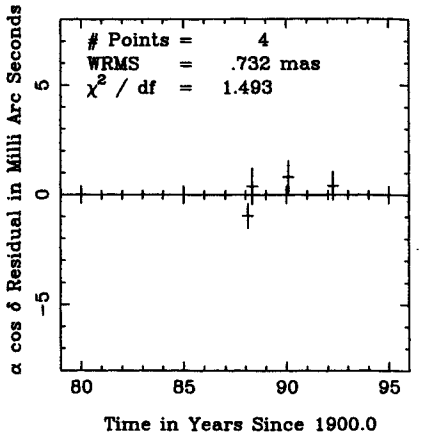
Arc Solution for 1022+194 : α cos δ



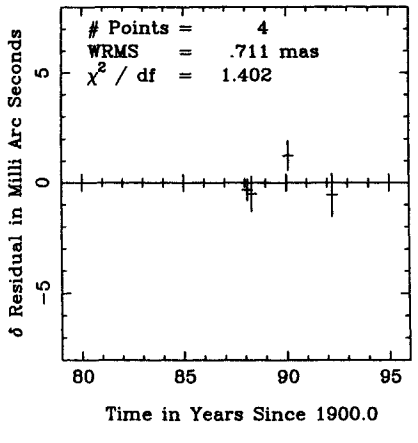
Arc Solution for 1022+194 : δ



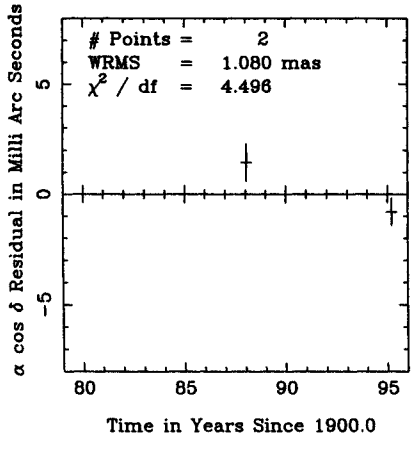
Arc Solution for 1030+415 : α cos δ



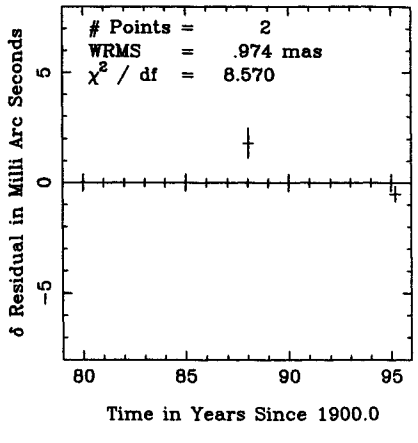
Arc Solution for 1030+415 : δ



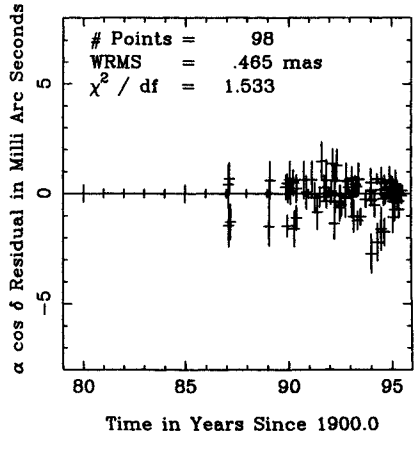
Arc Solution for 1032−199 : α cos δ



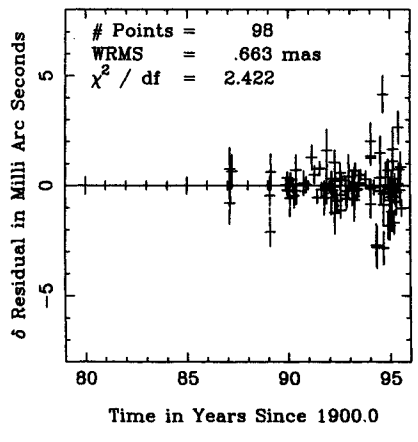
Arc Solution for 1032−199 : δ



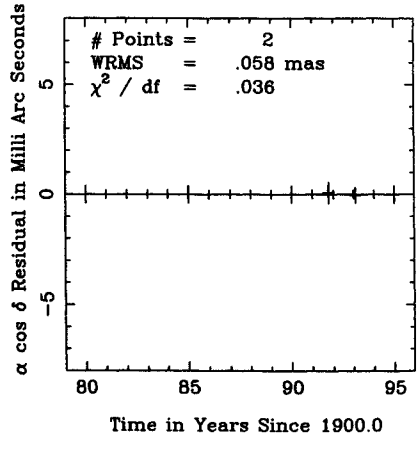
Arc Solution for 1034−293 : α cos δ



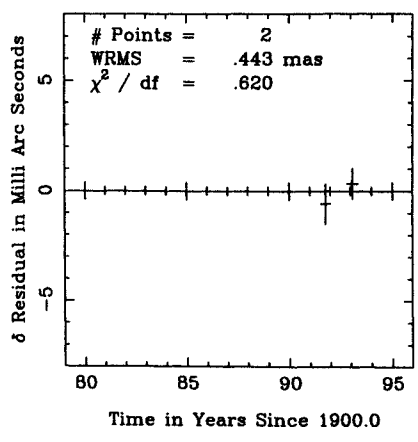
Arc Solution for 1034−293 : δ



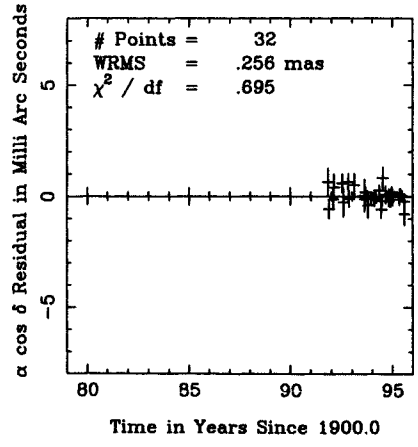
Arc Solution for 1038+064 : α cos δ



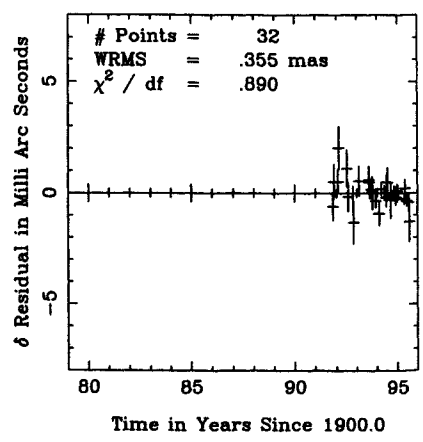
Arc Solution for 1038+064 : δ



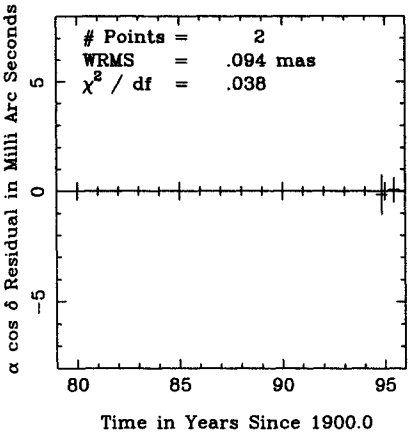
Arc Solution for 1038+528 : α cos δ



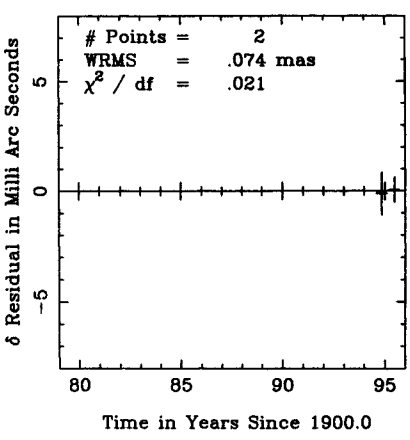
Arc Solution for 1038+528 : δ



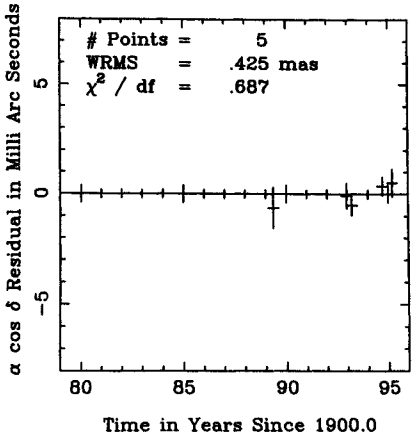
Arc Solution for 1038+529 : α cos δ



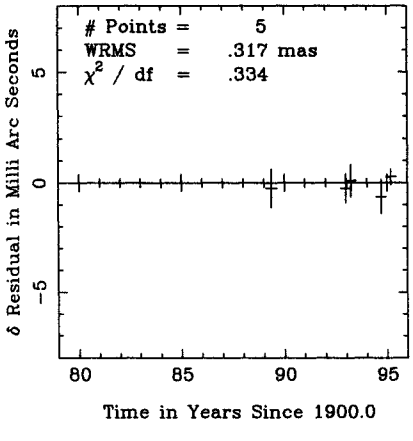
Arc Solution for 1038+529 : δ



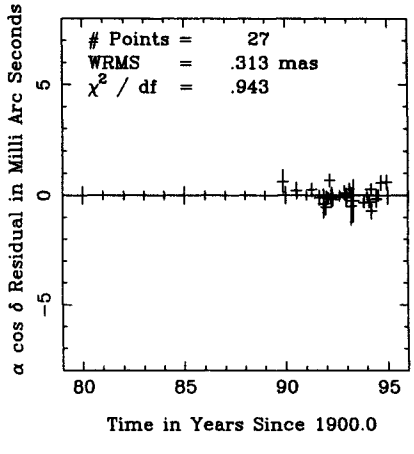
Arc Solution for 1040+123 : α cos δ



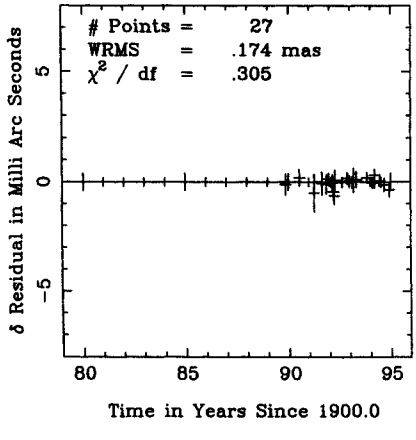
Arc Solution for 1040+123 : δ



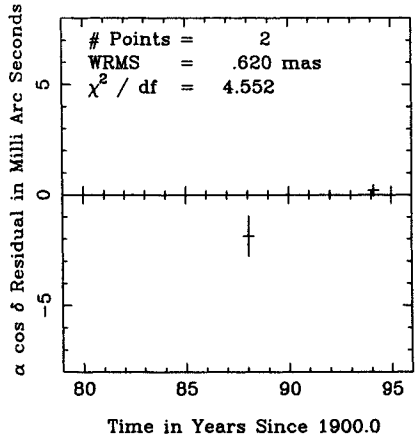
Arc Solution for 1039+811 : α cos δ



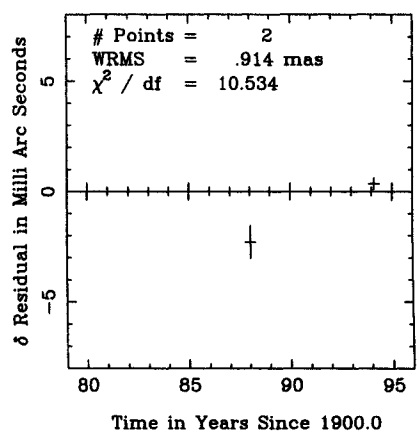
Arc Solution for 1039+811 : δ



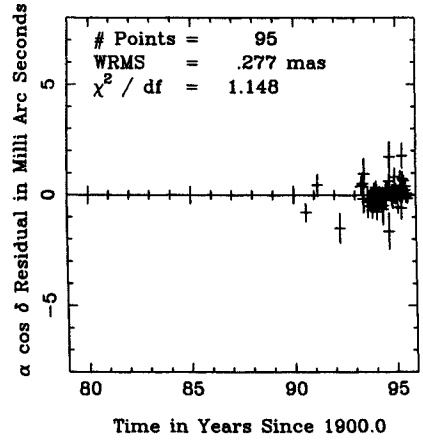
Arc Solution for 1045−188 : α cos δ



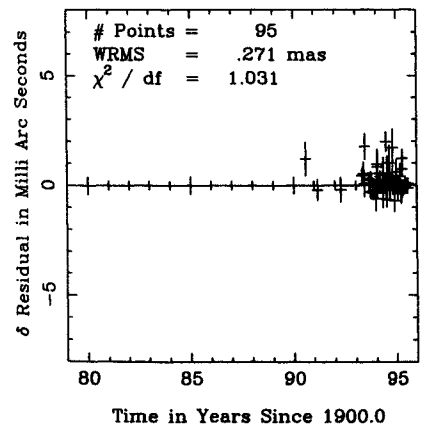
Arc Solution for 1045−188 : δ



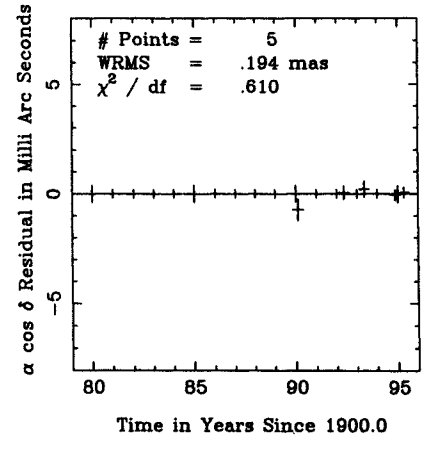
Arc Solution for 1044+719 : α cos δ



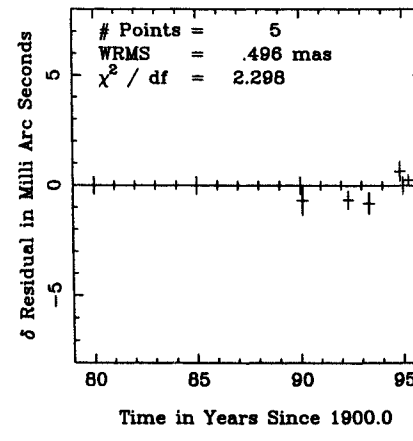
Arc Solution for 1044+719 : δ



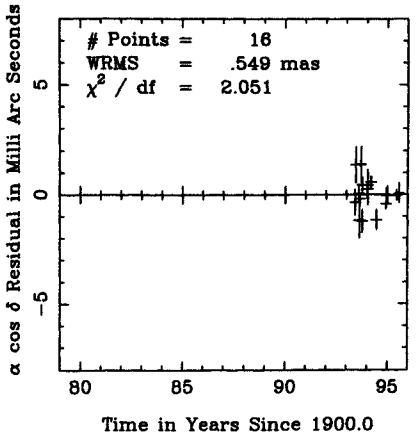
Arc Solution for 1049+215 : α cos δ



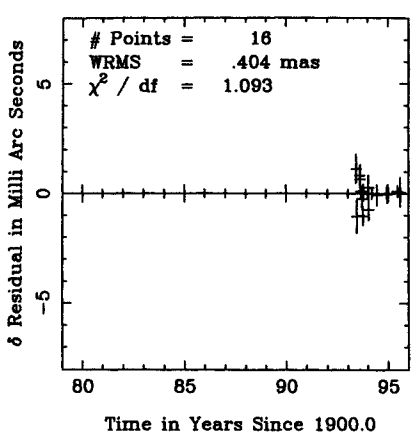
Arc Solution for 1049+215 : δ



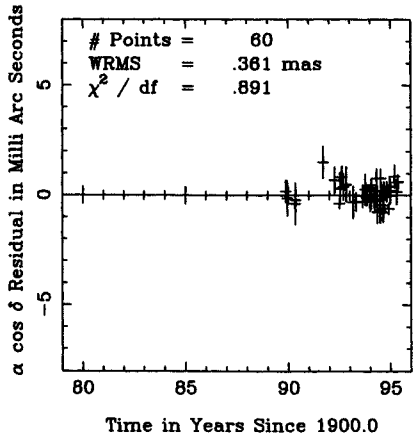
Arc Solution for 1053+704 : $\alpha \cos \delta$



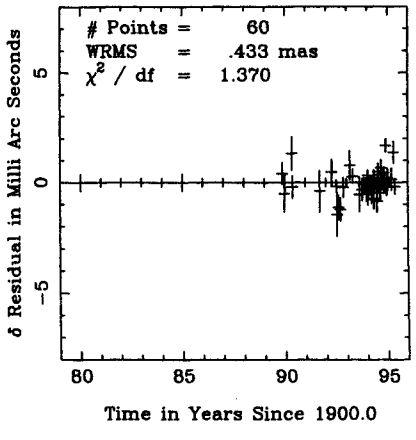
Arc Solution for 1053+704 : δ



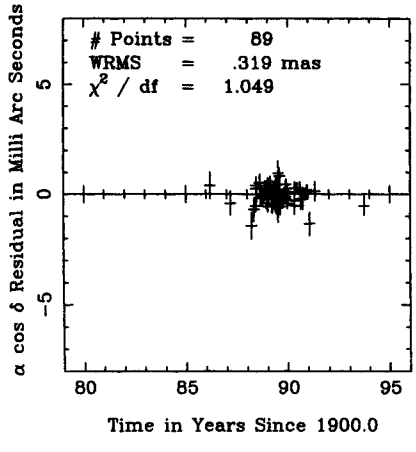
Arc Solution for 1053+815 : $\alpha \cos \delta$



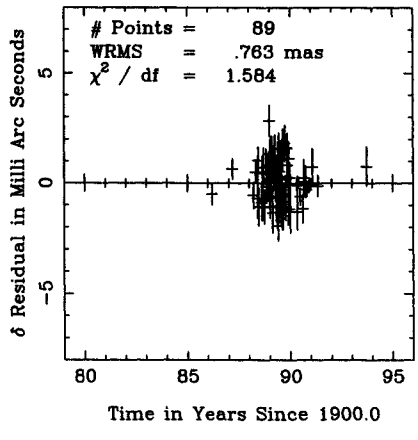
Arc Solution for 1053+815 : δ



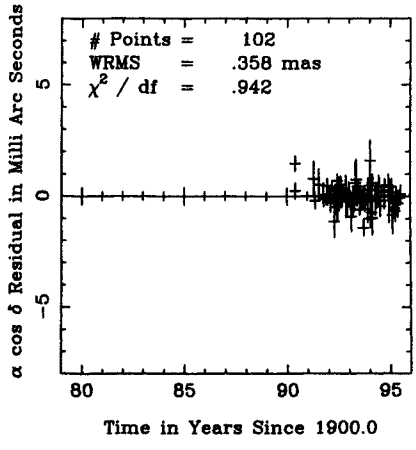
Arc Solution for 1055+018 : $\alpha \cos \delta$



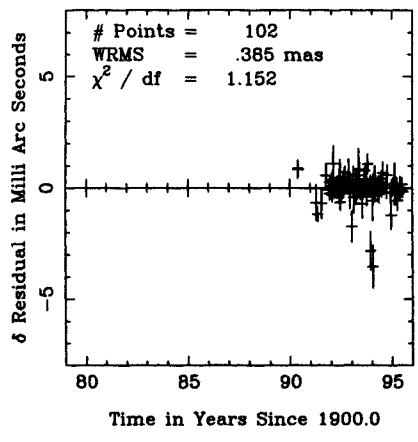
Arc Solution for 1055+018 : δ



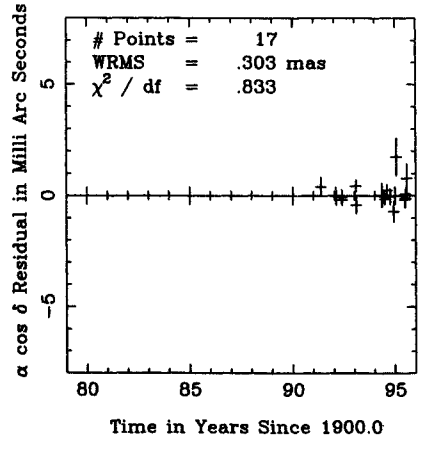
Arc Solution for 1057−797 : $\alpha \cos \delta$



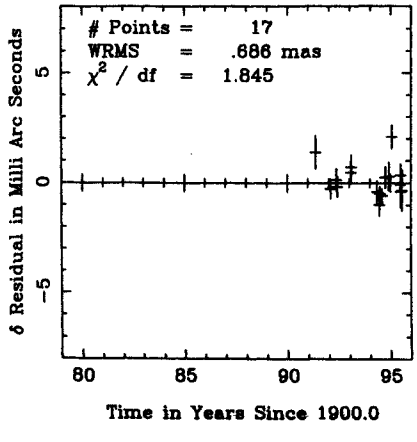
Arc Solution for 1057−797 : δ



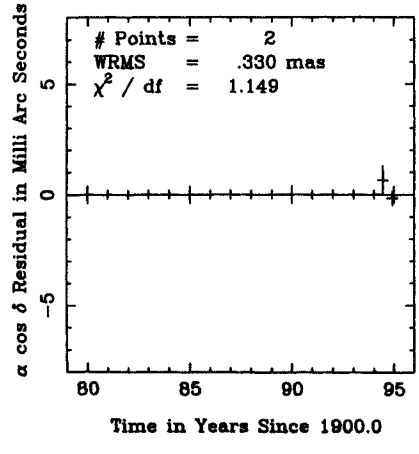
Arc Solution for 1101−536 : $\alpha \cos \delta$



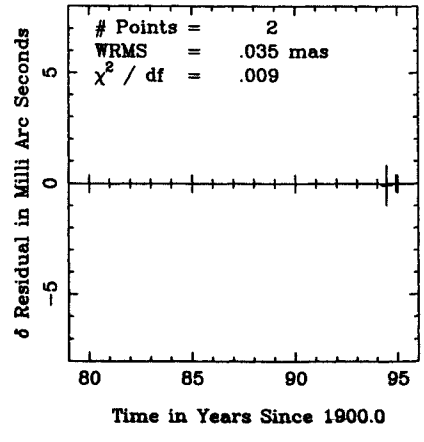
Arc Solution for 1101−536 : δ



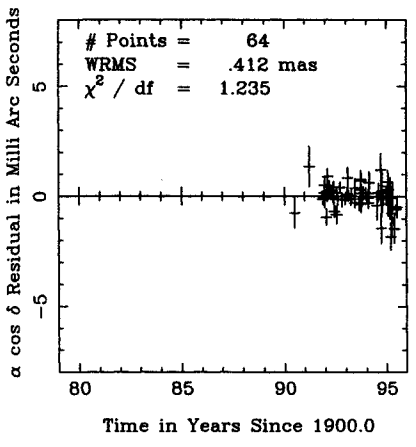
Arc Solution for 1101+384 : $\alpha \cos \delta$



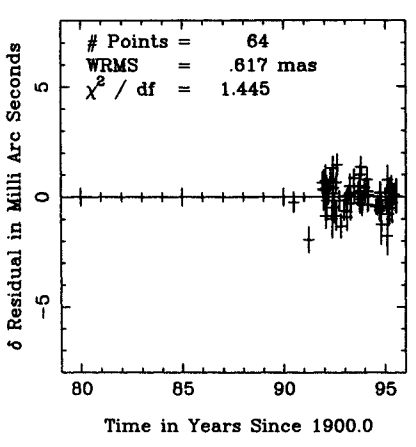
Arc Solution for 1101+384 : δ



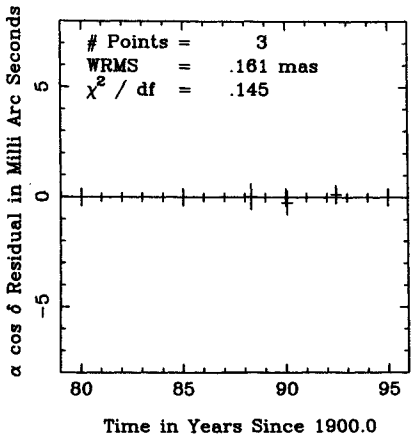
Arc Solution for 1104−445 : α cos δ



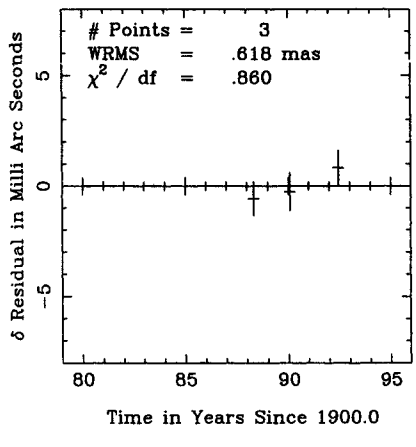
Arc Solution for 1104−445 : δ



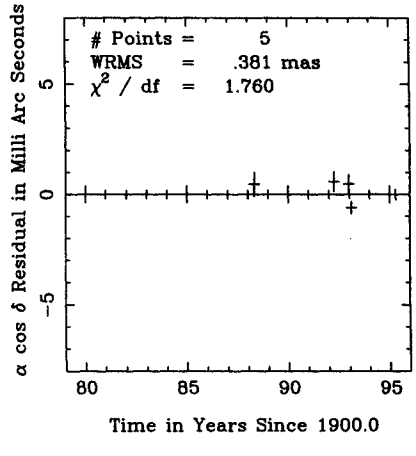
Arc Solution for 1111+149 : α cos δ



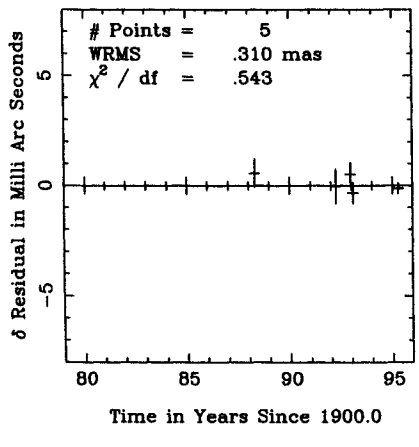
Arc Solution for 1111+149 : δ



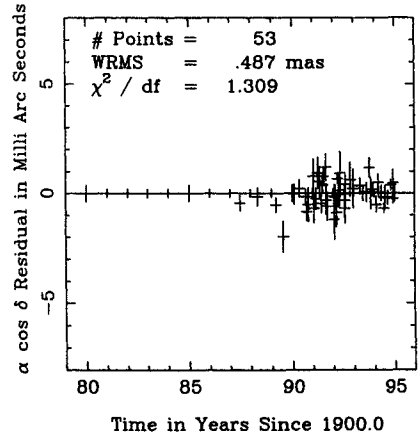
Arc Solution for 1116+128 : α cos δ



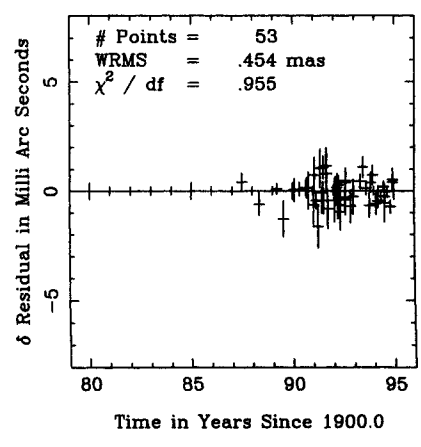
Arc Solution for 1116+128 : δ



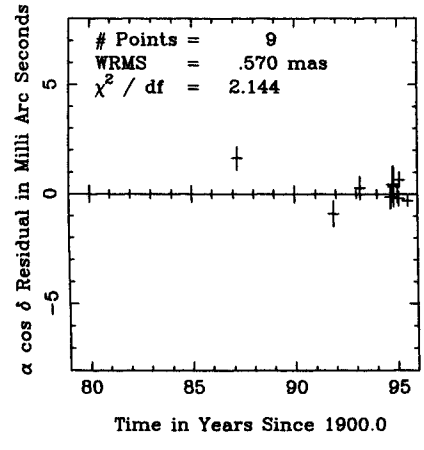
Arc Solution for 1123+264 : α cos δ



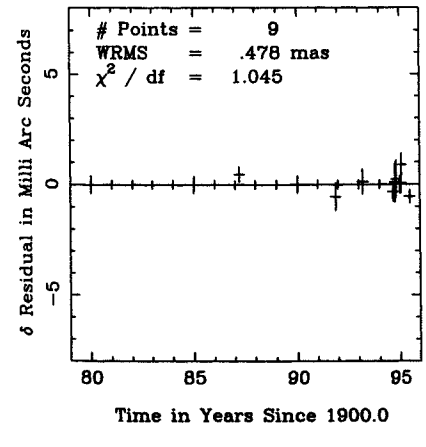
Arc Solution for 1123+264 : δ



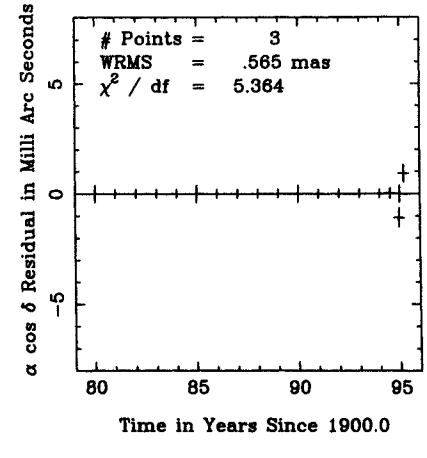
Arc Solution for 1124−186 : α cos δ



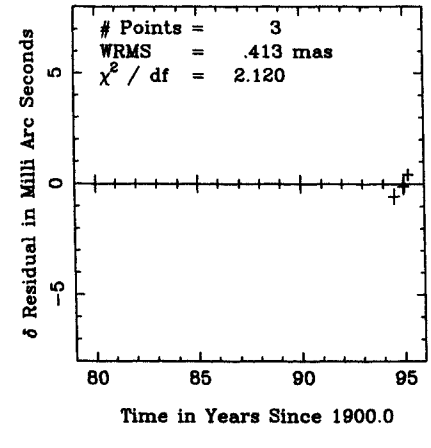
Arc Solution for 1124−186 : δ

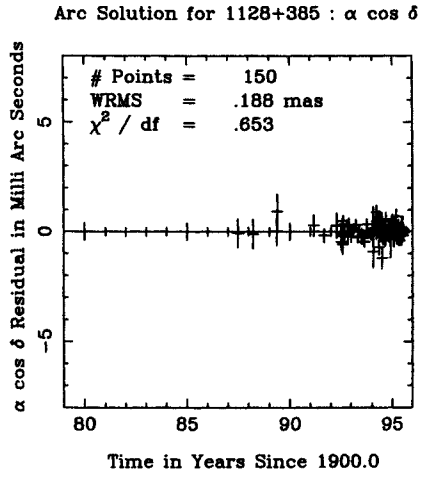


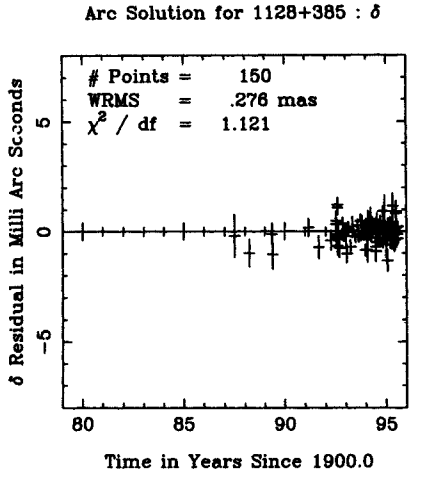
Arc Solution for 1127−145 : α cos δ

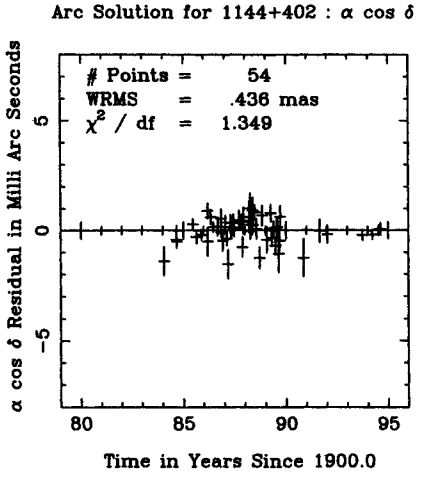


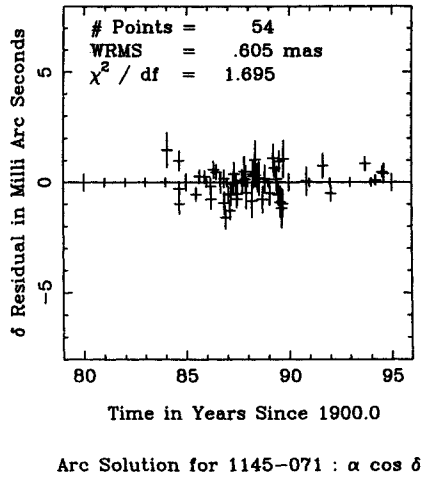
Arc Solution for 1127−145 : δ

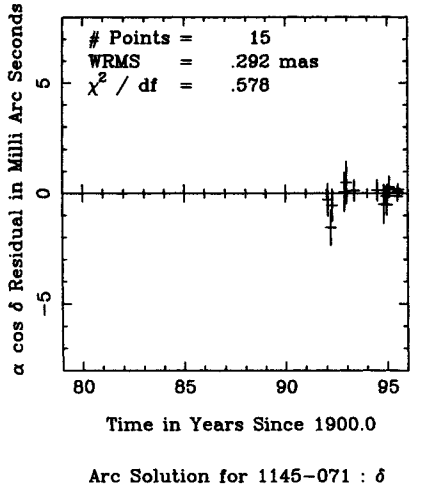


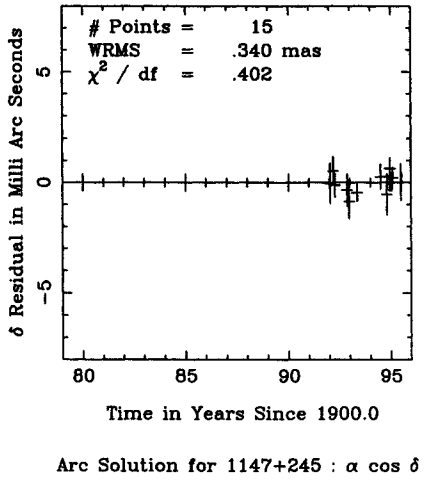

Arc Solution for 1128+385 : α cos δ
# Points = 150
WRMS = .188 mas
χ² / df = .653
α cos δ Residual in Milli Arc Seconds
Time in Years Since 1900.0

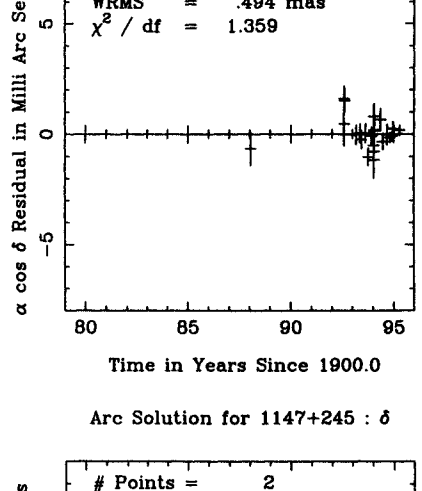

Arc Solution for 1128+385 : δ
# Points = 150
WRMS = .276 mas
χ² / df = 1.121
δ Residual in Milli Arc Seconds
Time in Years Since 1900.0

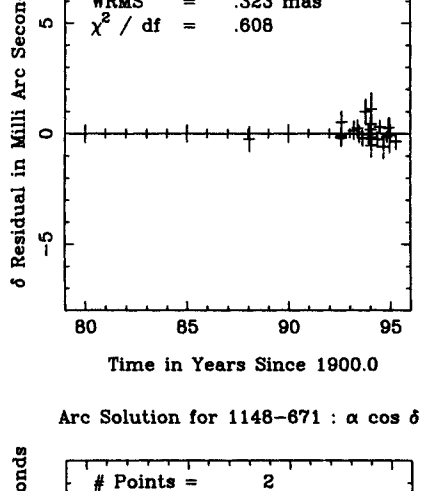

Arc Solution for 1144+402 : α cos δ
# Points = 54
WRMS = .436 mas
χ² / df = 1.349
α cos δ Residual in Milli Arc Seconds
Time in Years Since 1900.0

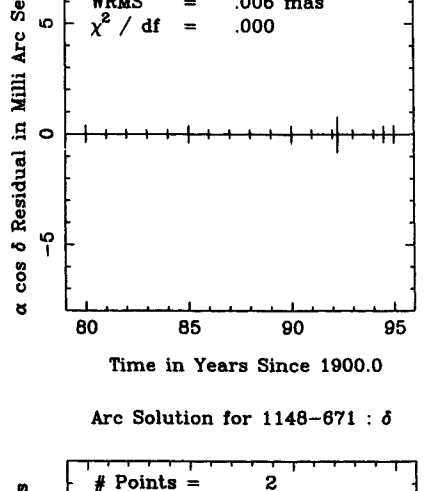

Arc Solution for 1144+402 : δ
# Points = 54
WRMS = .605 mas
χ² / df = 1.695
δ Residual in Milli Arc Seconds
Time in Years Since 1900.0

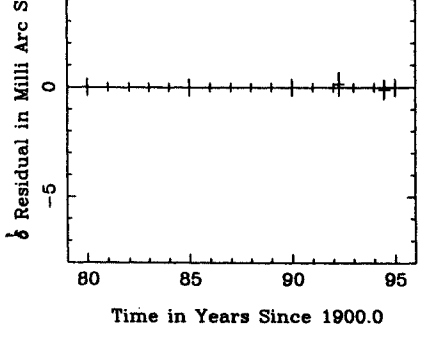

Arc Solution for 1144-379 : α cos δ
# Points = 15
WRMS = .292 mas
χ² / df = .578
α cos δ Residual in Milli Arc Seconds
Time in Years Since 1900.0

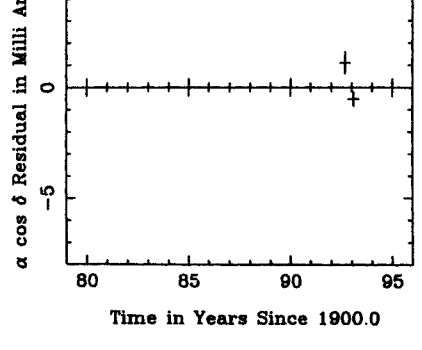

Arc Solution for 1144-379 : δ
# Points = 15
WRMS = .340 mas
χ² / df = .402
δ Residual in Milli Arc Seconds
Time in Years Since 1900.0

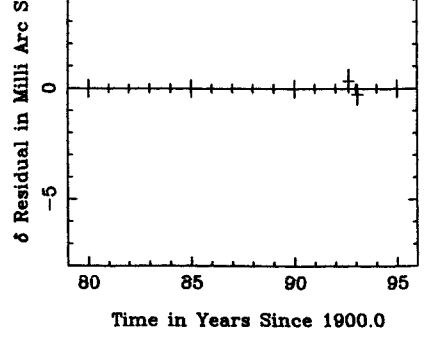

Arc Solution for 1145-071 : α cos δ
# Points = 24
WRMS = .494 mas
χ² / df = 1.359
α cos δ Residual in Milli Arc Seconds
Time in Years Since 1900.0


Arc Solution for 1145-071 : δ
# Points = 24
WRMS = .323 mas
χ² / df = .608
δ Residual in Milli Arc Seconds
Time in Years Since 1900.0

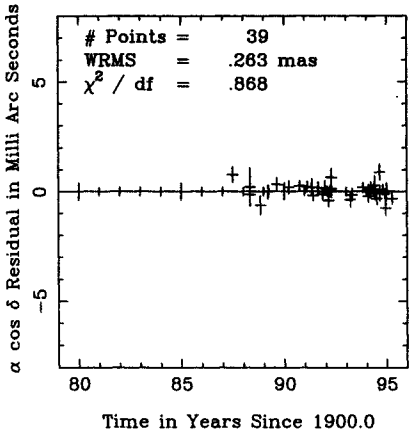

Arc Solution for 1147+245 : α cos δ
# Points = 2
WRMS = .006 mas
χ² / df = .000
α cos δ Residual in Milli Arc Seconds
Time in Years Since 1900.0


Arc Solution for 1147+245 : δ
# Points = 2
WRMS = .128 mas
χ² / df = .130
δ Residual in Milli Arc Seconds
Time in Years Since 1900.0

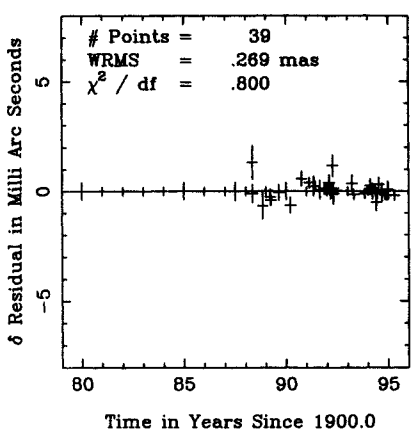

Arc Solution for 1148-671 : α cos δ
# Points = 2
WRMS = .762 mas
χ² / df = 6.753
α cos δ Residual in Milli Arc Seconds
Time in Years Since 1900.0


Arc Solution for 1148-671 : δ
# Points = 2
WRMS = .301 mas
χ² / df = .702
δ Residual in Milli Arc Seconds
Time in Years Since 1900.0

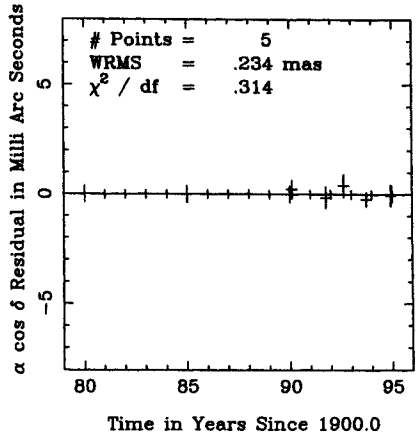
Arc Solution for 1150+812 : $\alpha \cos \delta$



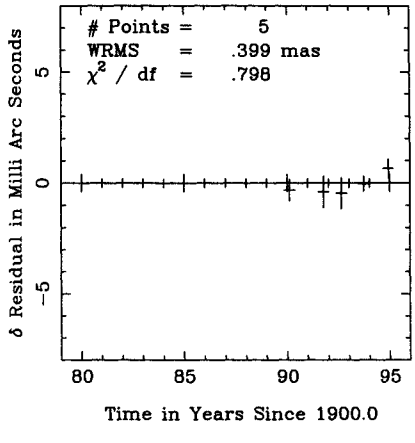
Arc Solution for 1150+812 : δ



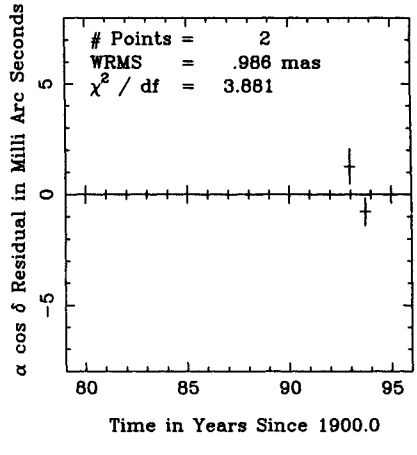
Arc Solution for 1150+497 : $\alpha \cos \delta$



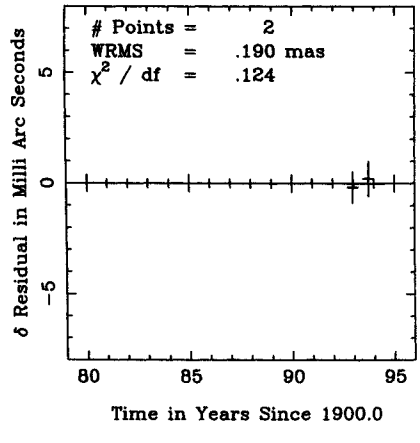
Arc Solution for 1150+497 : δ



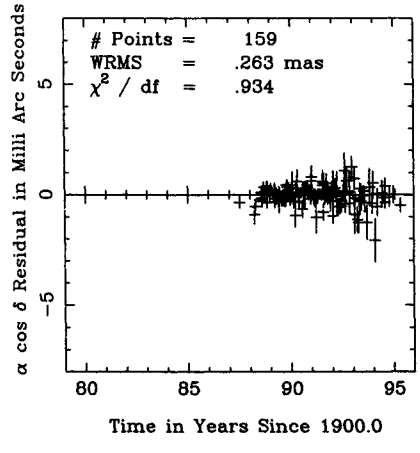
Arc Solution for 1155+251 : $\alpha \cos \delta$



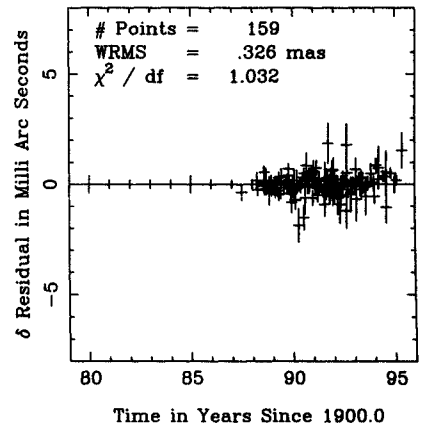
Arc Solution for 1155+251 : δ



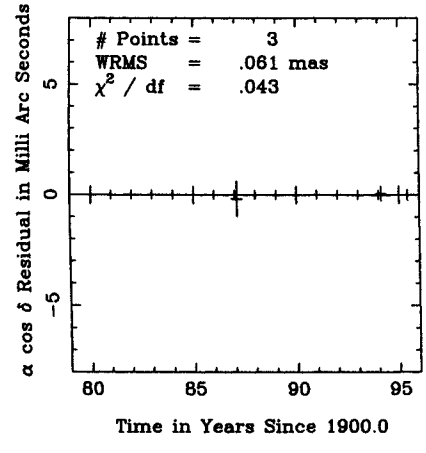
Arc Solution for 1156+295 : $\alpha \cos \delta$



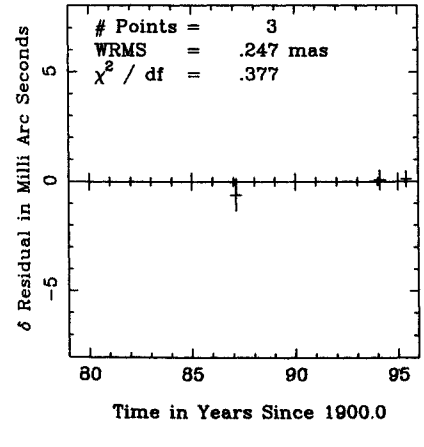
Arc Solution for 1156+295 : δ



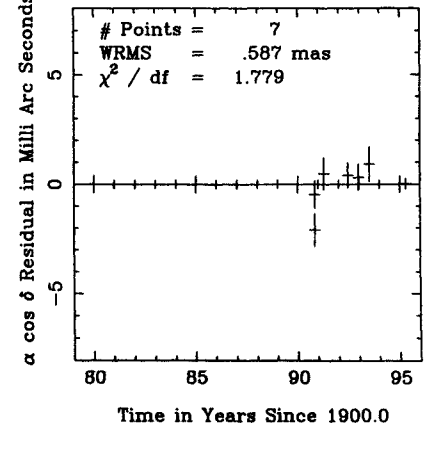
Arc Solution for 1213−172 : $\alpha \cos \delta$



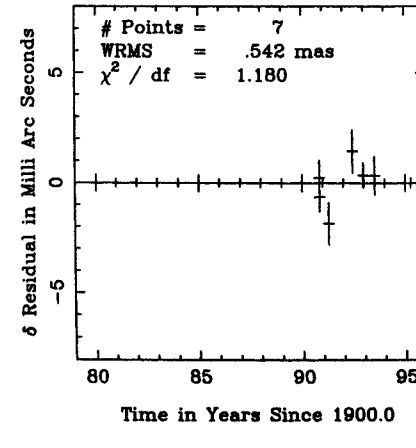
Arc Solution for 1213−172 : δ



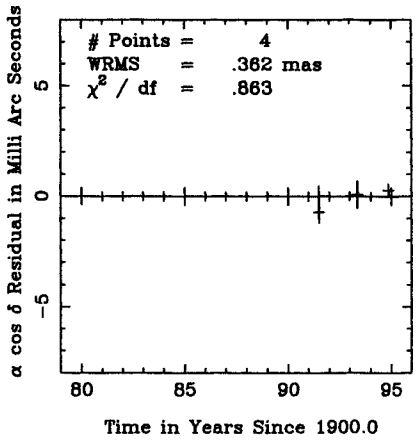
Arc Solution for 1213+350 : $\alpha \cos \delta$



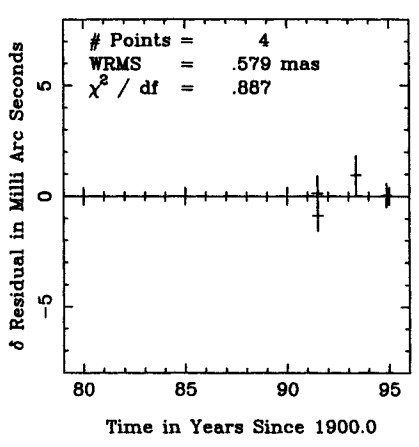
Arc Solution for 1213+350 : δ



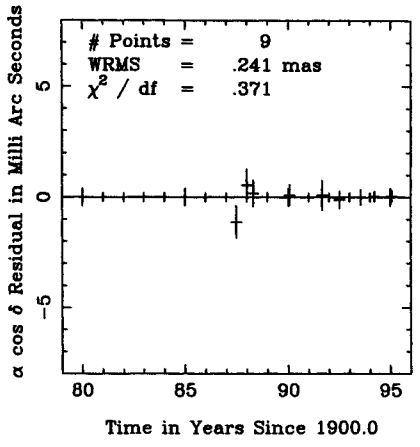
Arc Solution for 1215+303 : α cos δ



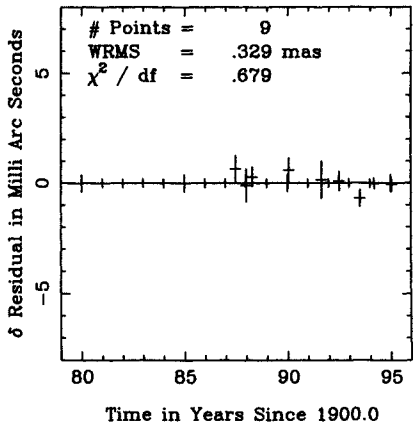
Arc Solution for 1215+303 : δ



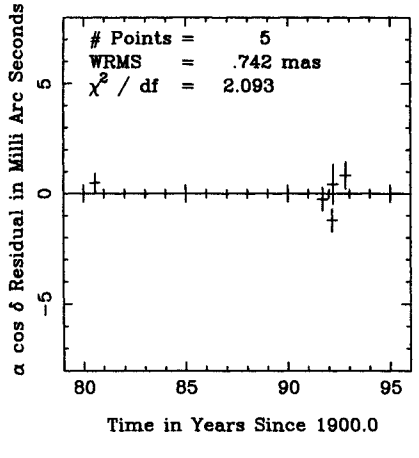
Arc Solution for 1216+487 : α cos δ



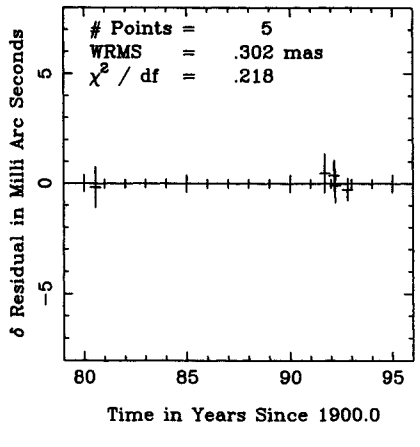
Arc Solution for 1216+487 : δ



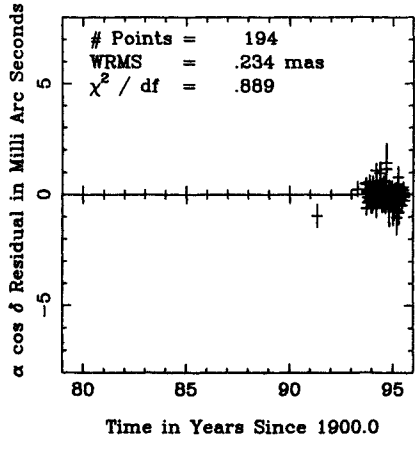
Arc Solution for 1219+285 : α cos δ



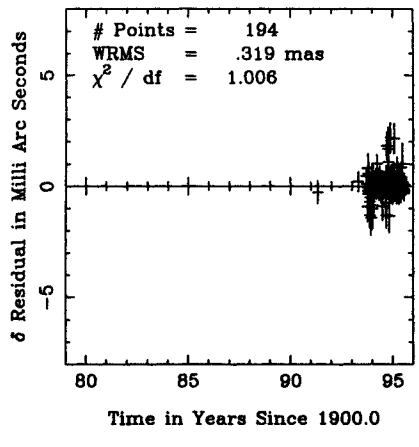
Arc Solution for 1219+285 : δ



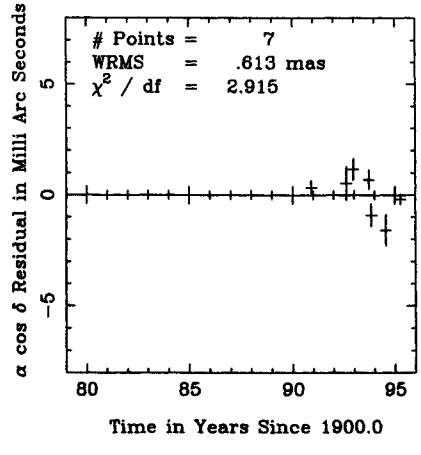
Arc Solution for 1219+044 : α cos δ



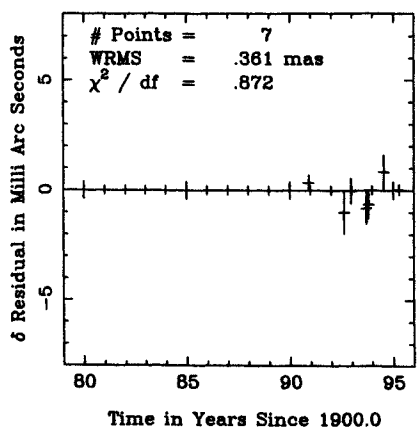
Arc Solution for 1219+044 : δ



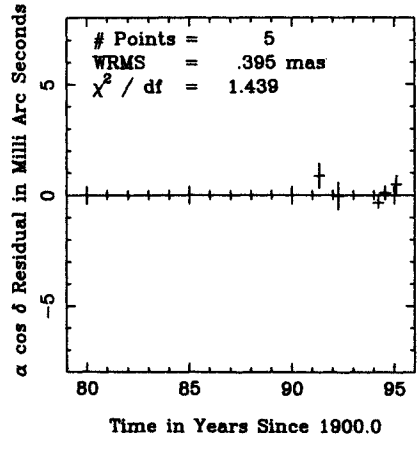
Arc Solution for 1221+809 : α cos δ



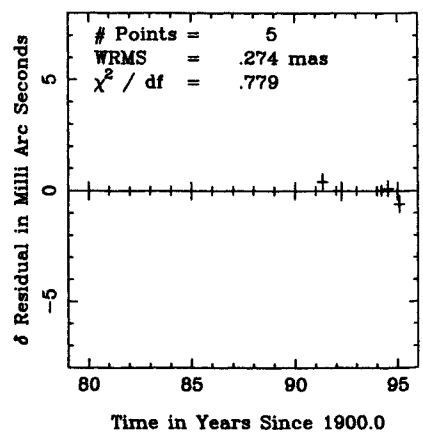
Arc Solution for 1221+809 : δ



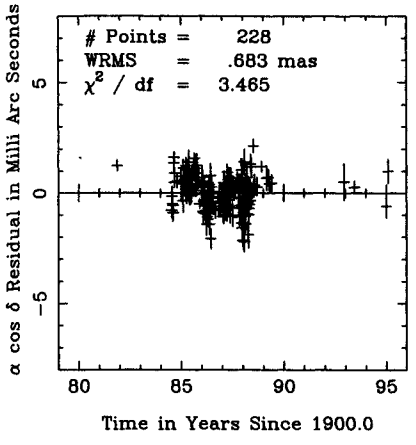
Arc Solution for 1226+373 : α cos δ



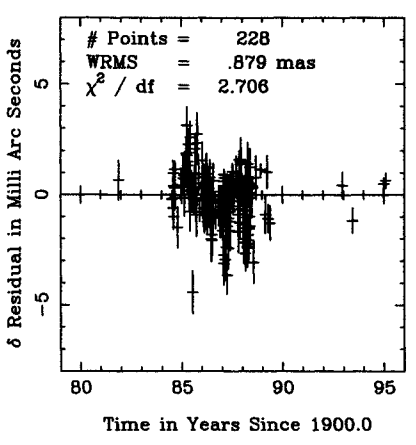
Arc Solution for 1226+373 : δ



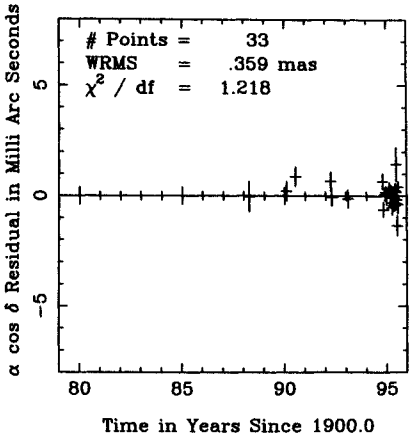
Arc Solution for 1226+023 : α cos δ



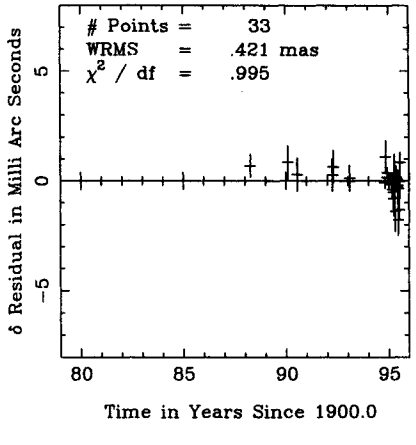
Arc Solution for 1226+023 : δ



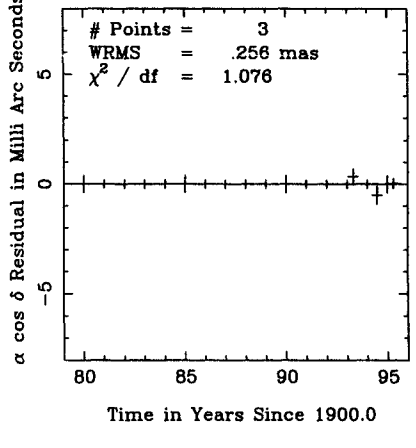
Arc Solution for 1228+126 : α cos δ



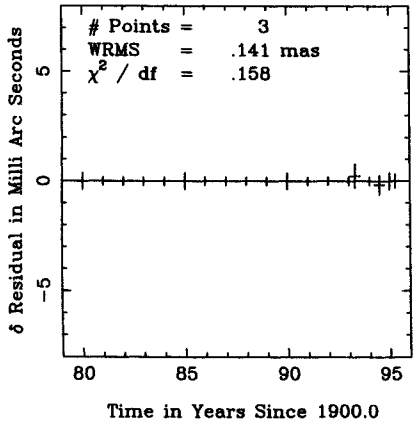
Arc Solution for 1228+126 : δ



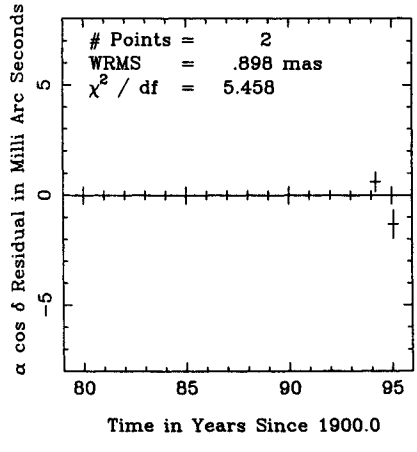
Arc Solution for 1236+077 : α cos δ



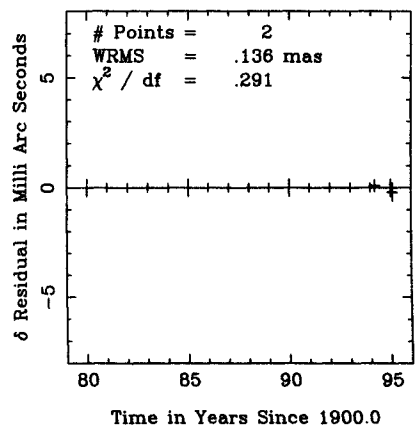
Arc Solution for 1236+077 : δ



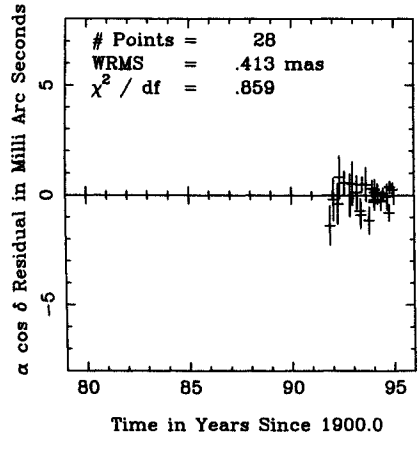
Arc Solution for 1240+381 : α cos δ



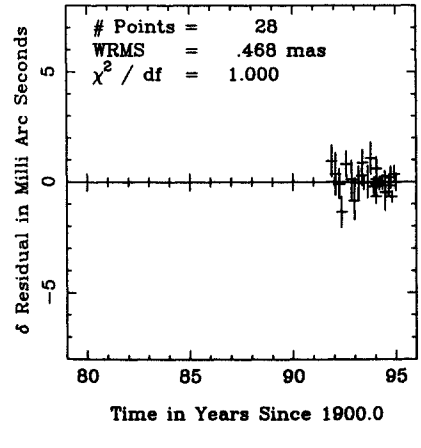
Arc Solution for 1240+381 : δ



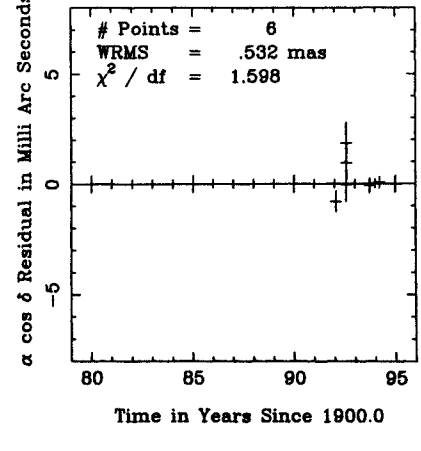
Arc Solution for 1244−255 : α cos δ



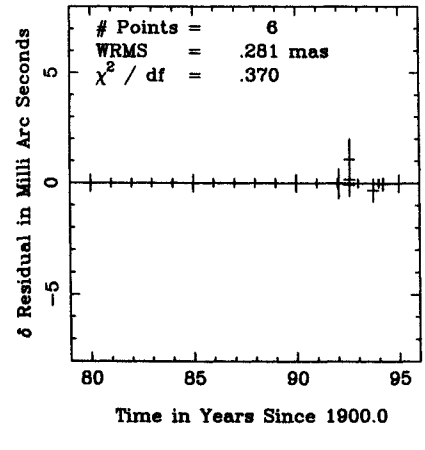
Arc Solution for 1244−255 : δ



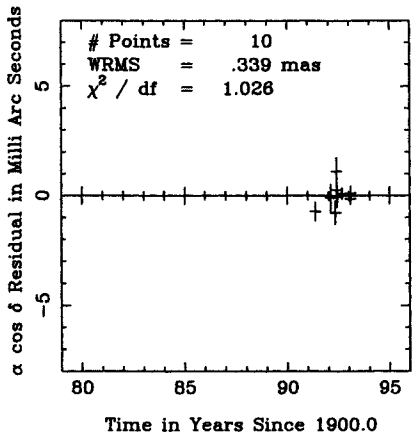
Arc Solution for 1252+119 : α cos δ



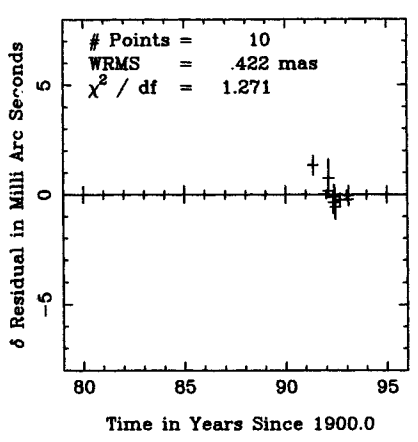
Arc Solution for 1252+119 : δ



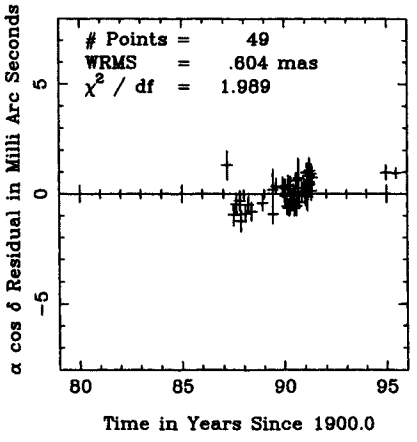
Arc Solution for 1251−713 : α cos δ



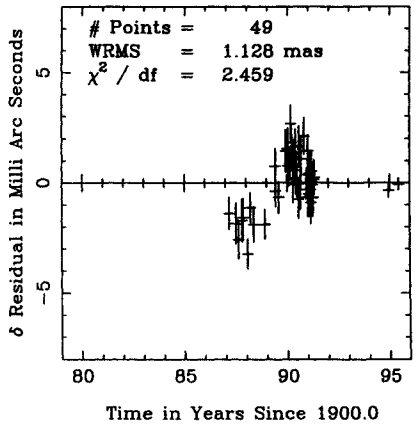
Arc Solution for 1251−713 : δ



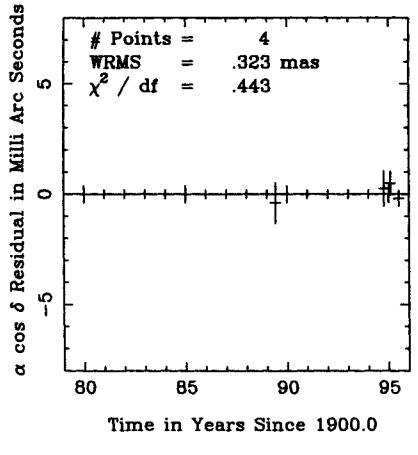
Arc Solution for 1253−055 : α cos δ



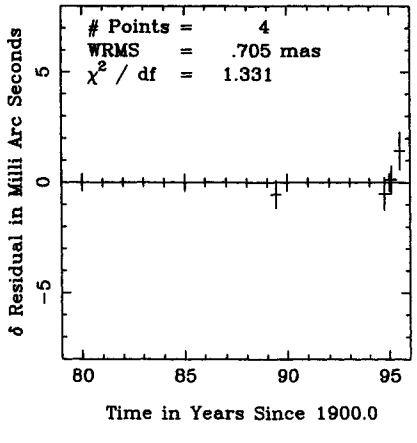
Arc Solution for 1253−055 : δ



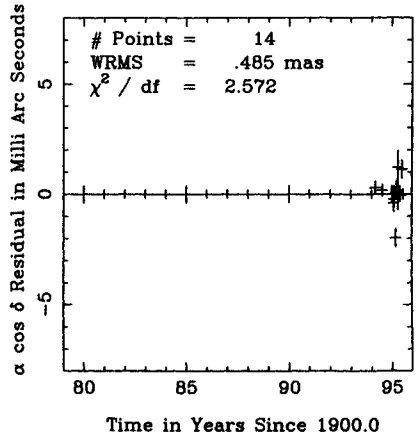
Arc Solution for 1255−316 : α cos δ



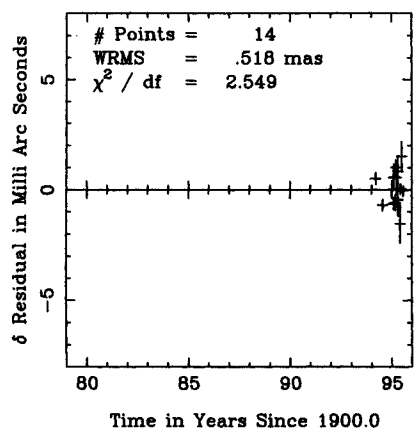
Arc Solution for 1255−316 : δ



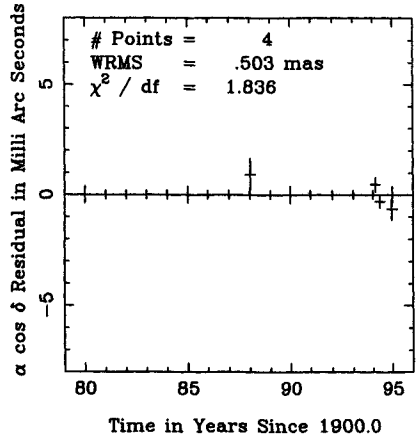
Arc Solution for 1300+580 : α cos δ



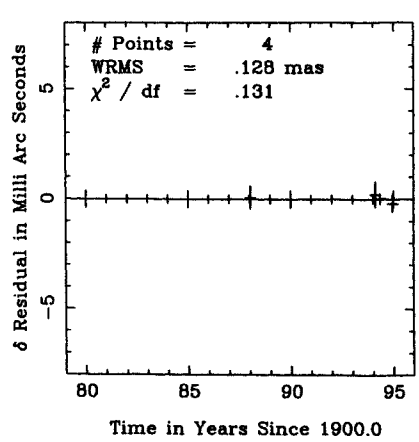
Arc Solution for 1300+580 : δ



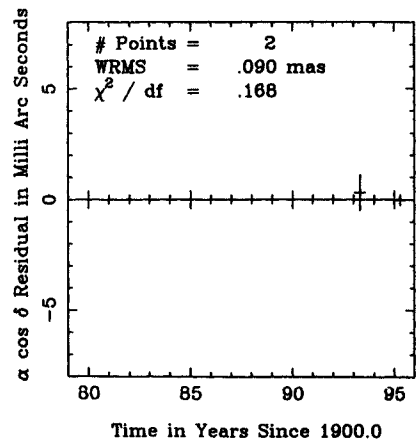
Arc Solution for 1302−102 : α cos δ



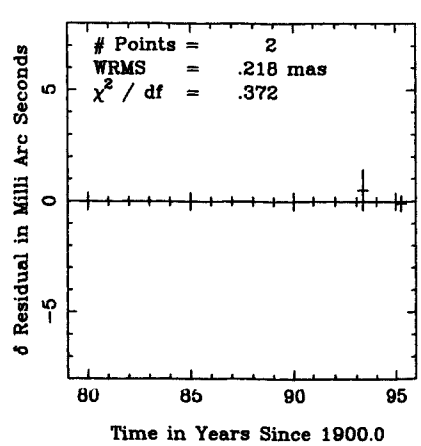
Arc Solution for 1302−102 : δ



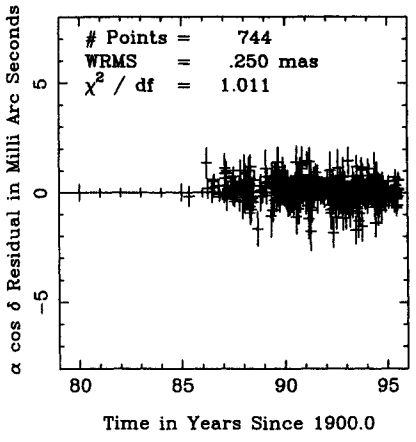
Arc Solution for 1307+121 : α cos δ



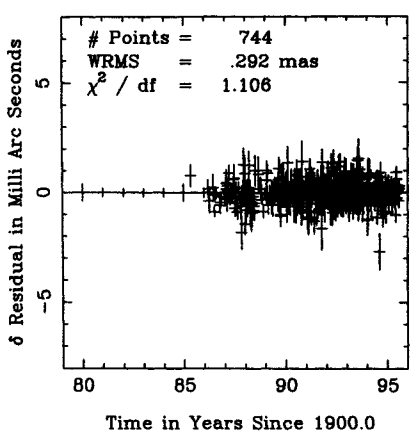
Arc Solution for 1307+121 : δ



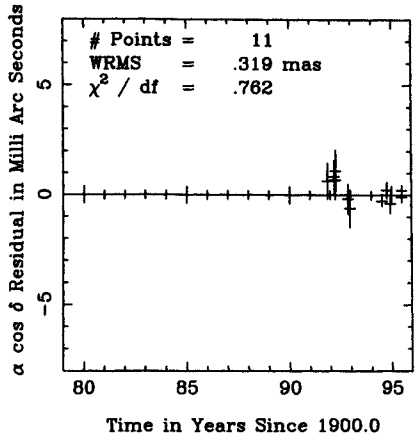
Arc Solution for 1308+326 : $\alpha \cos \delta$



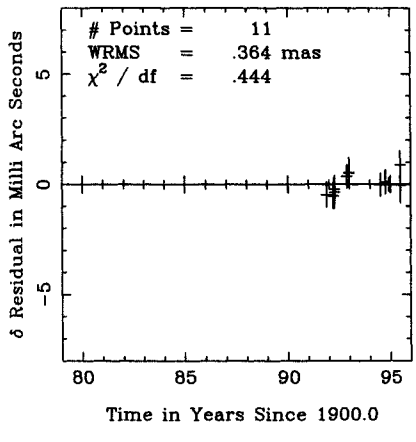
Arc Solution for 1308+326 : δ



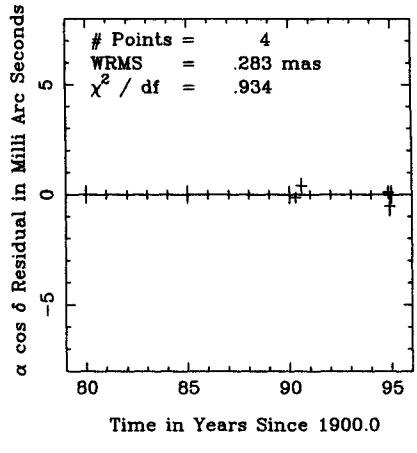
Arc Solution for 1313−333 : $\alpha \cos \delta$



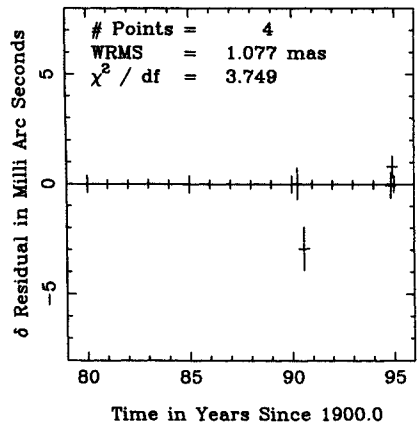
Arc Solution for 1313−333 : δ



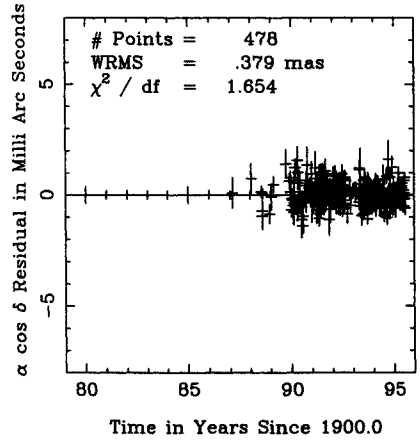
Arc Solution for 1315+346 : $\alpha \cos \delta$



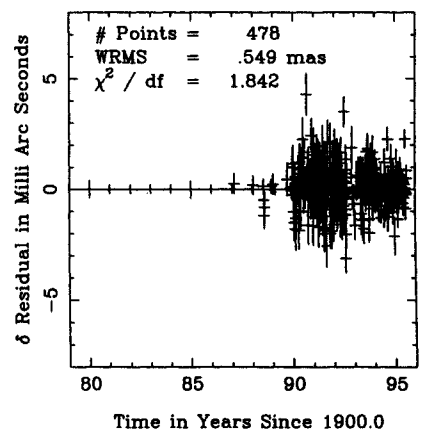
Arc Solution for 1315+346 : δ



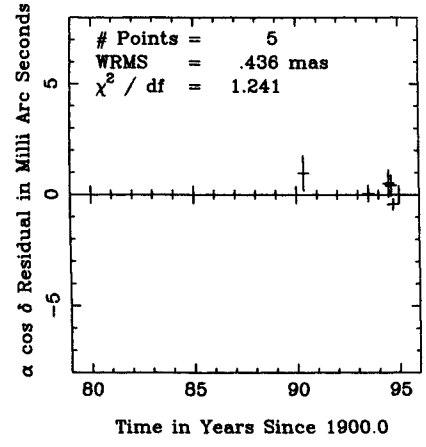
Arc Solution for 1334−127 : $\alpha \cos \delta$



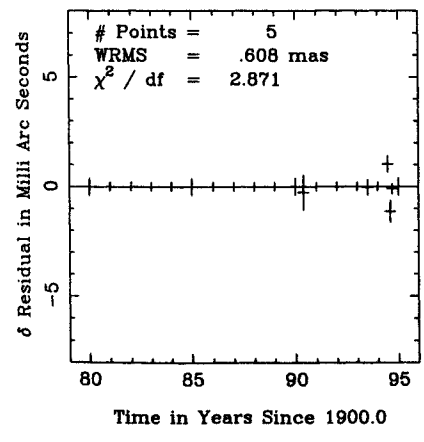
Arc Solution for 1334−127 : δ



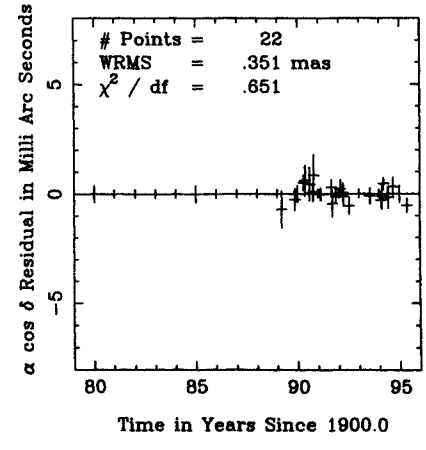
Arc Solution for 1342+662 : $\alpha \cos \delta$



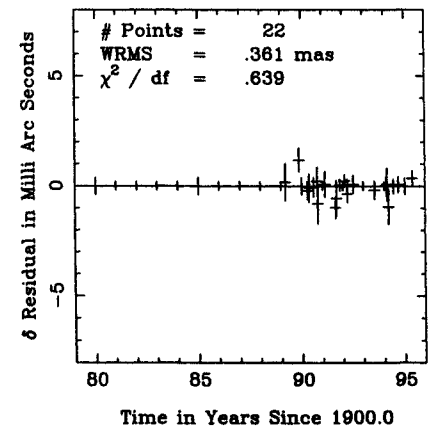
Arc Solution for 1342+662 : δ



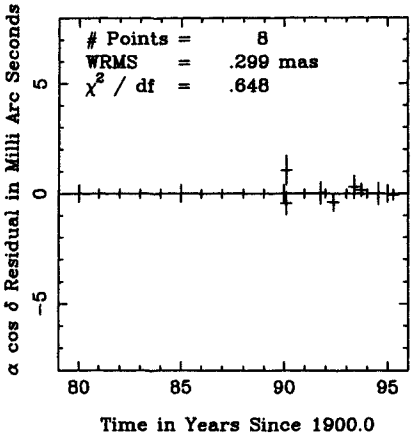
Arc Solution for 1342+663 : $\alpha \cos \delta$



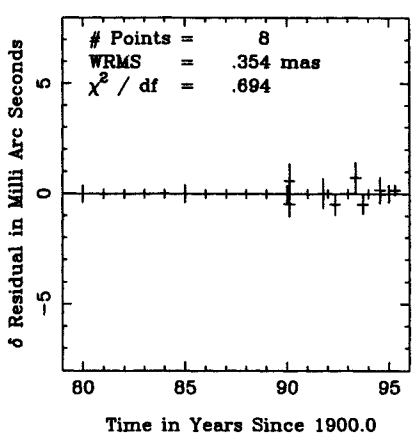
Arc Solution for 1342+663 : δ



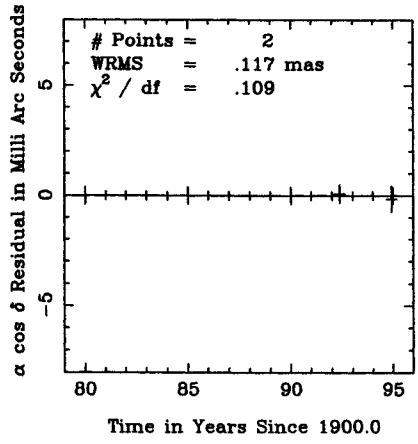
Arc Solution for 1347+539 : $\alpha \cos \delta$



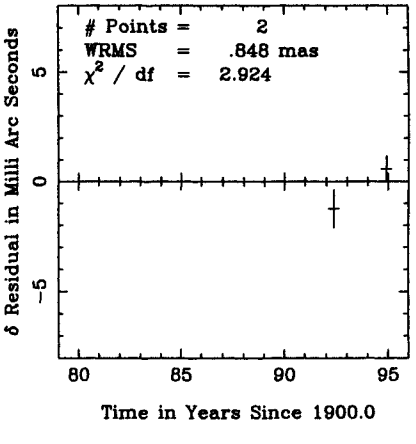
Arc Solution for 1347+539 : δ



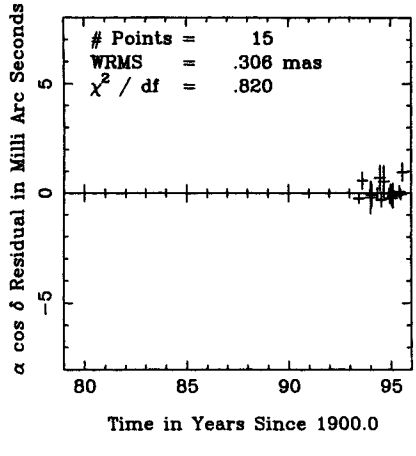
Arc Solution for 1349−439 : $\alpha \cos \delta$



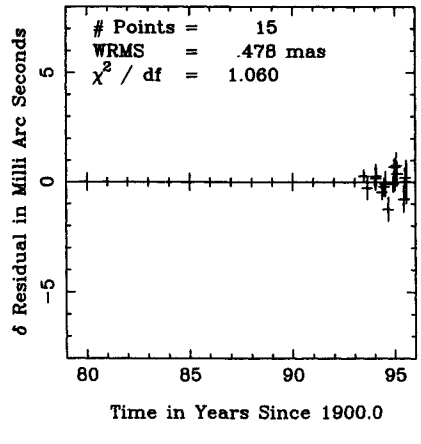
Arc Solution for 1349−439 : δ



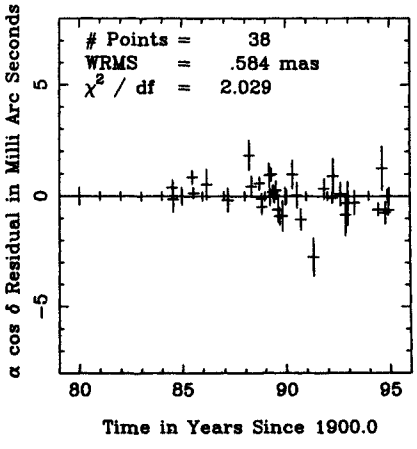
Arc Solution for 1351−018 : $\alpha \cos \delta$



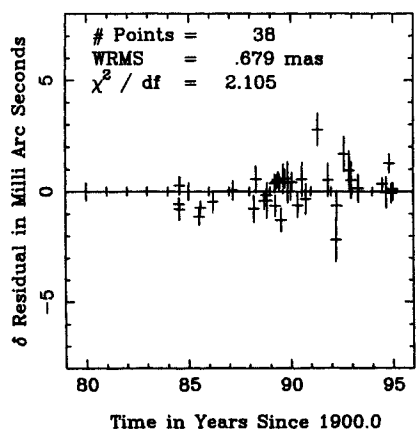
Arc Solution for 1351−018 : δ



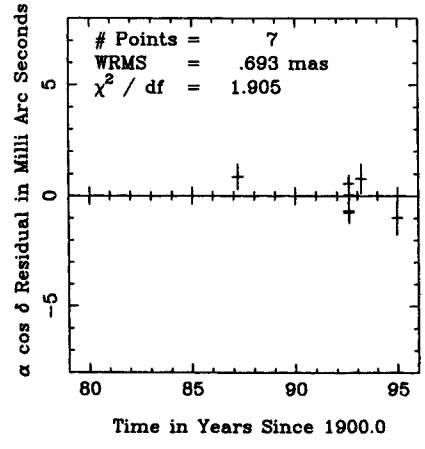
Arc Solution for 1354+195 : $\alpha \cos \delta$



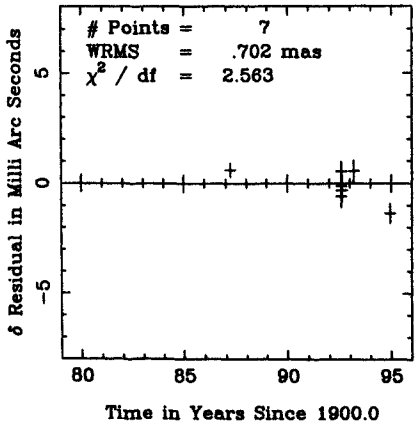
Arc Solution for 1354+195 : δ



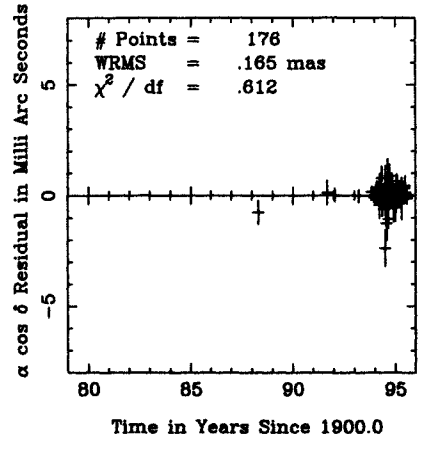
Arc Solution for 1354−152 : $\alpha \cos \delta$



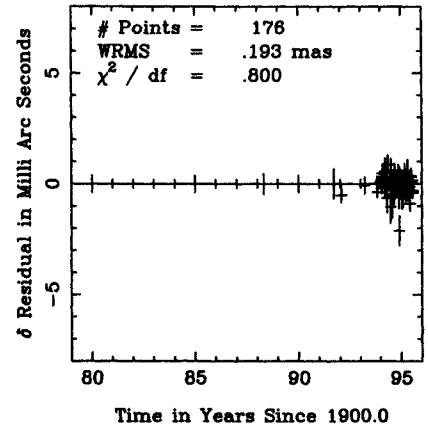
Arc Solution for 1354−152 : δ



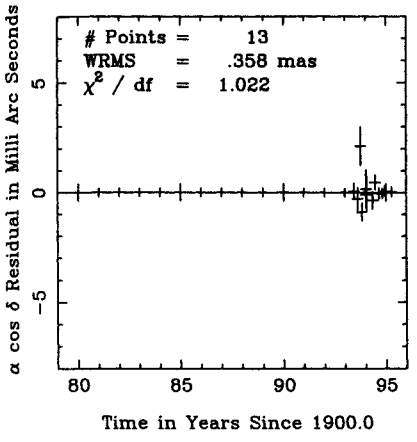
Arc Solution for 1357+769 : $\alpha \cos \delta$



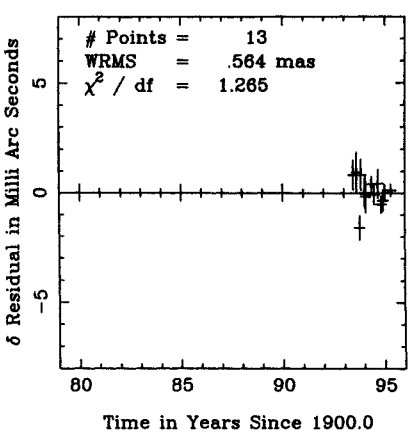
Arc Solution for 1357+769 : δ



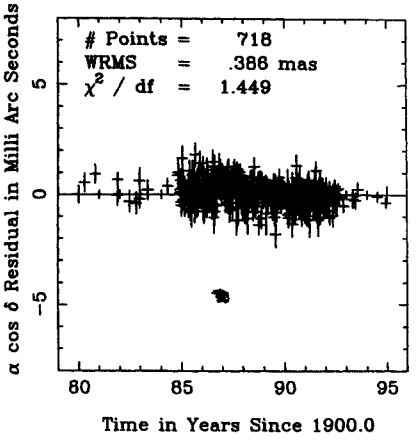
Arc Solution for 1402+044 : $\alpha \cos \delta$



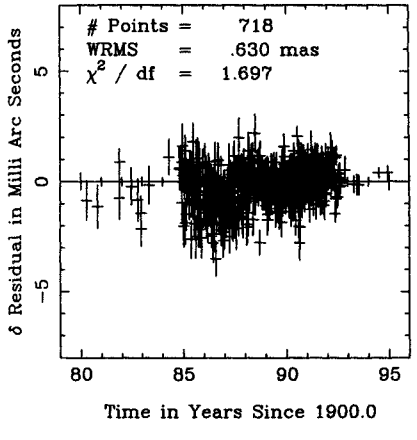
Arc Solution for 1402+044 : δ



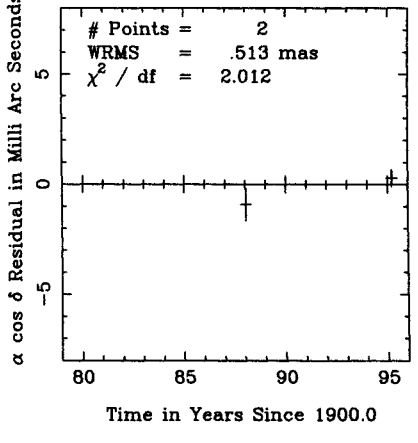
Arc Solution for 1404+286 : $\alpha \cos \delta$



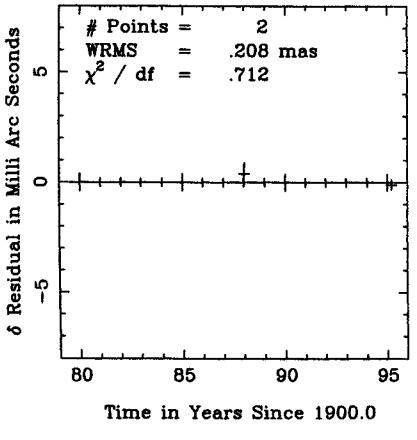
Arc Solution for 1404+286 : δ



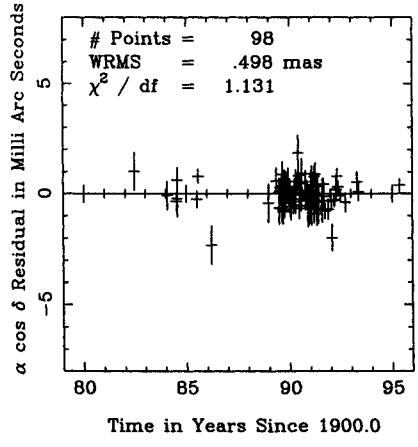
Arc Solution for 1406−076 : $\alpha \cos \delta$



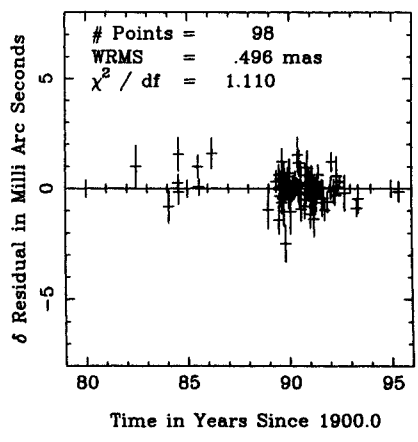
Arc Solution for 1406−076 : δ



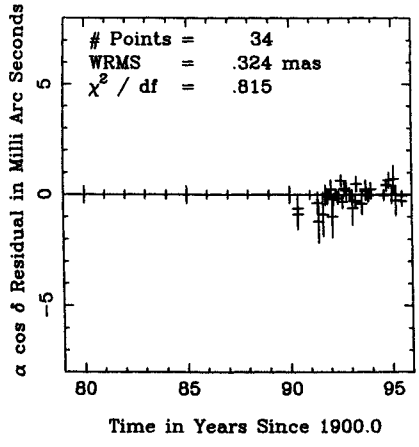
Arc Solution for 1418+546 : $\alpha \cos \delta$



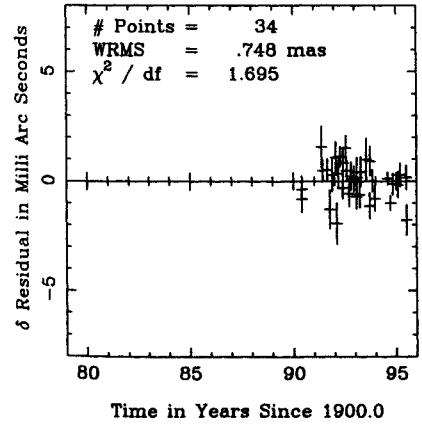
Arc Solution for 1418+546 : δ



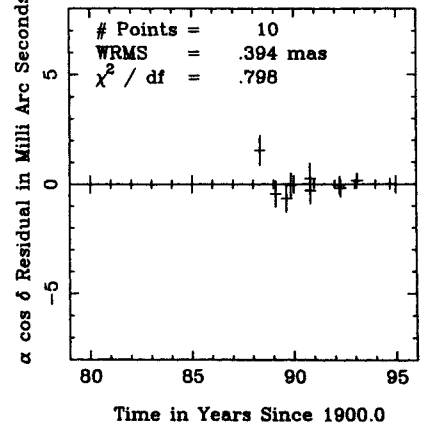
Arc Solution for 1424−418 : $\alpha \cos \delta$



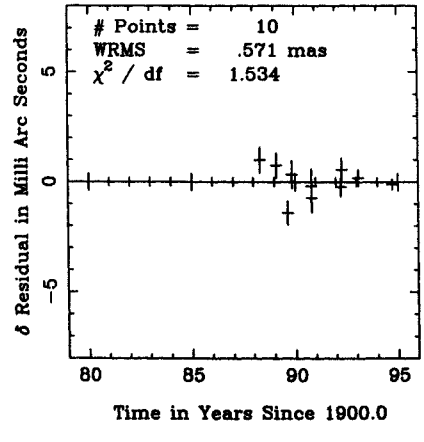
Arc Solution for 1424−418 : δ



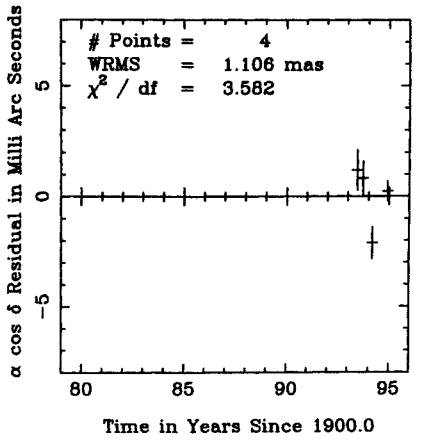
Arc Solution for 1435+638 : $\alpha \cos \delta$



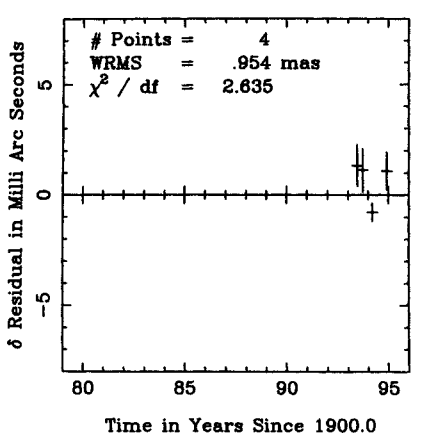
Arc Solution for 1435+638 : δ



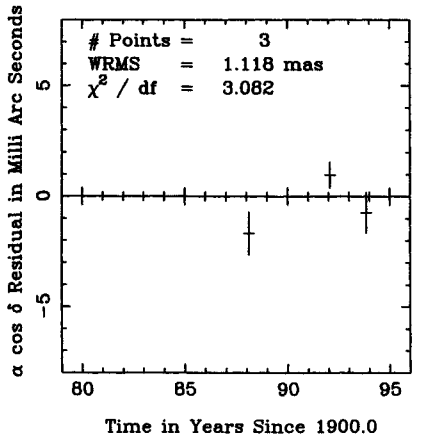
Arc Solution for 1442+101 : $\alpha \cos \delta$



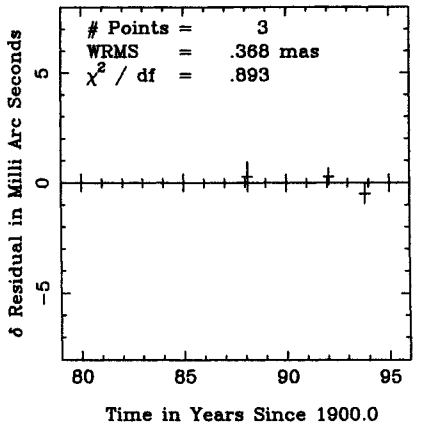
Arc Solution for 1442+101 : δ



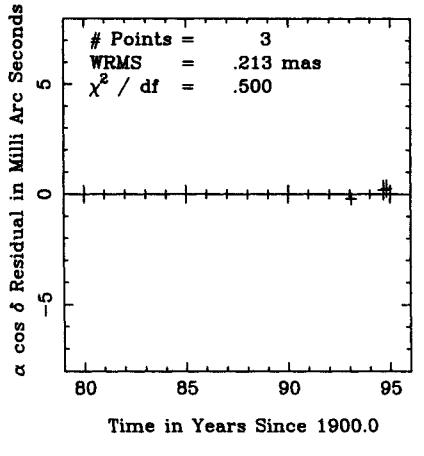
Arc Solution for 1448+762 : $\alpha \cos \delta$



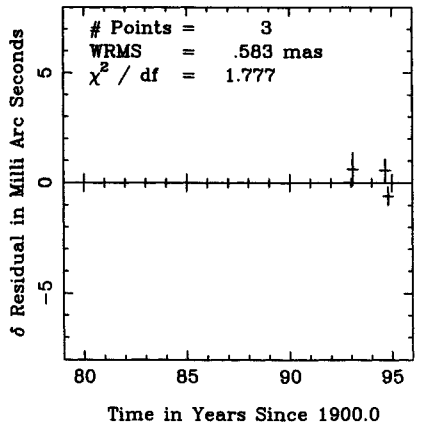
Arc Solution for 1448+762 : δ



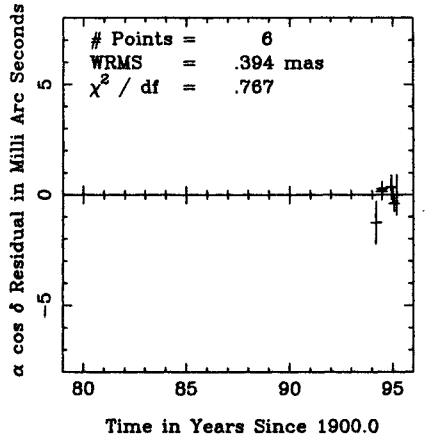
Arc Solution for 1451−375 : $\alpha \cos \delta$



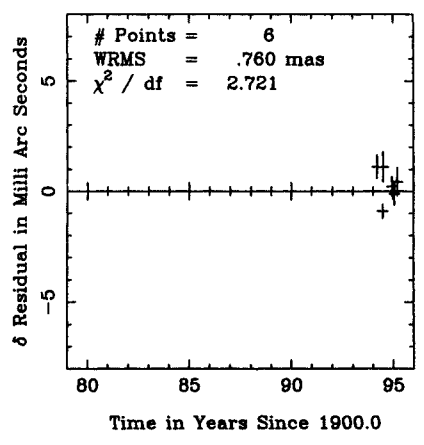
Arc Solution for 1451−375 : δ



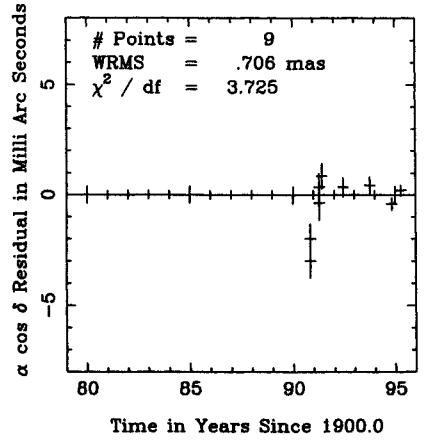
Arc Solution for 1451−400 : $\alpha \cos \delta$



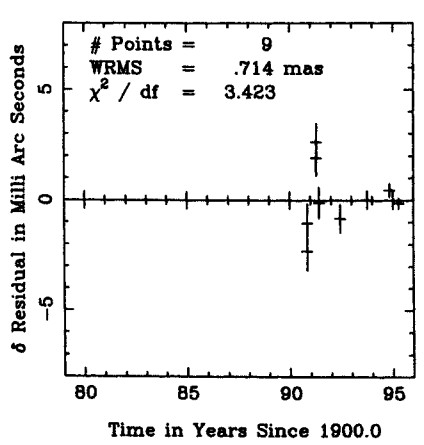
Arc Solution for 1451−400 : δ



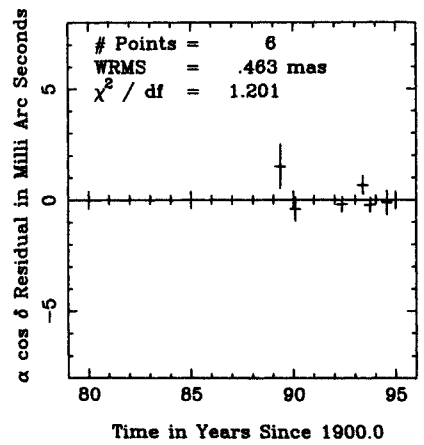
Arc Solution for 1458+718 : $\alpha \cos \delta$



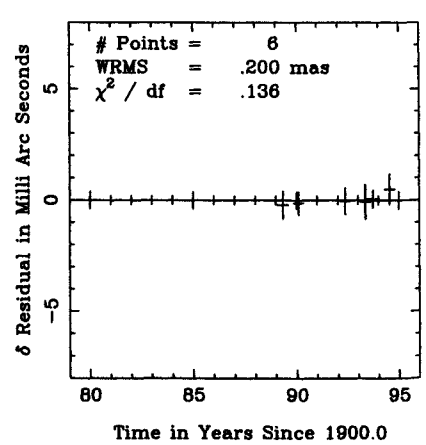
Arc Solution for 1458+718 : δ



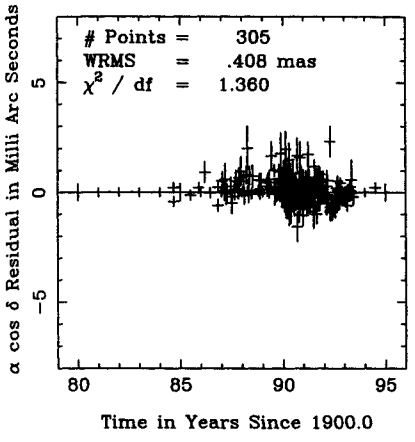
Arc Solution for 1459+480 : $\alpha \cos \delta$



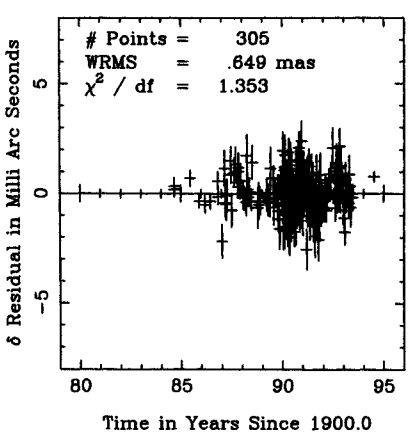
Arc Solution for 1459+480 : δ



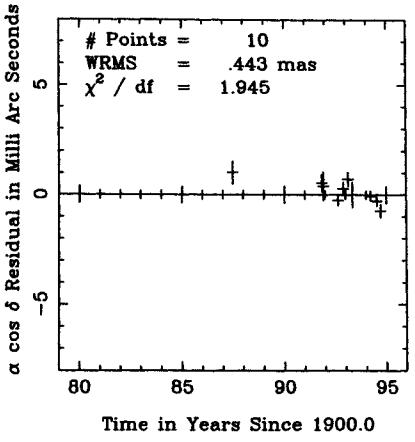
Arc Solution for 1502+106 : $\alpha \cos \delta$



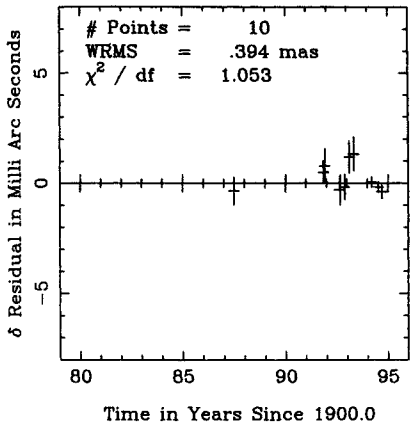
Arc Solution for 1502+106 : δ



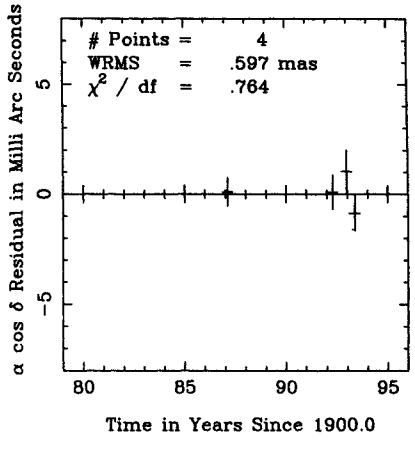
Arc Solution for 1504+377 : $\alpha \cos \delta$



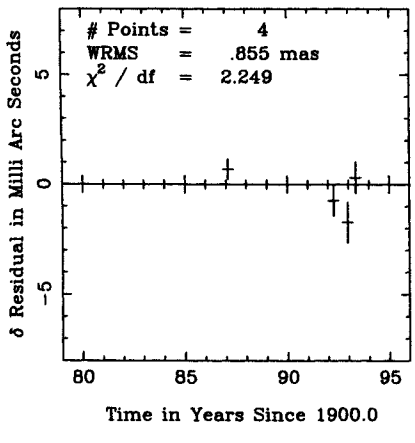
Arc Solution for 1504+377 : δ



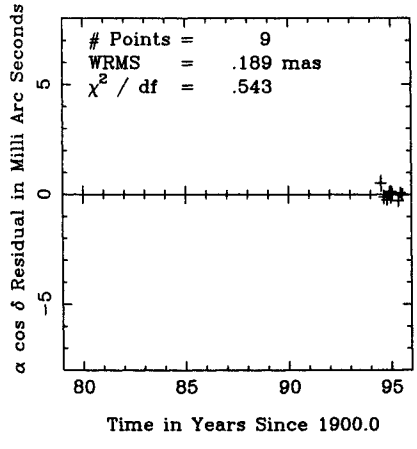
Arc Solution for 1504−166 : $\alpha \cos \delta$



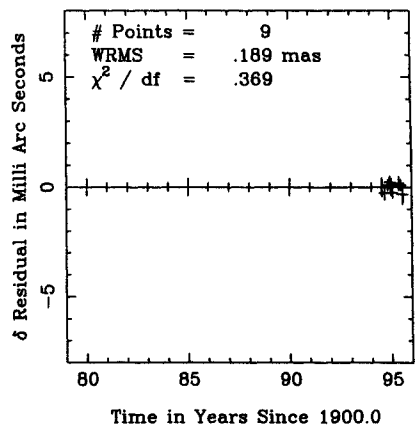
Arc Solution for 1504−166 : δ



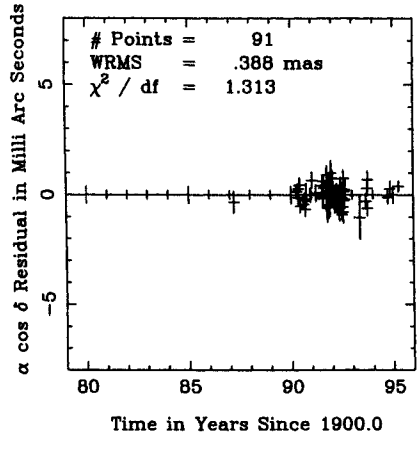
Arc Solution for 1508+572 : $\alpha \cos \delta$



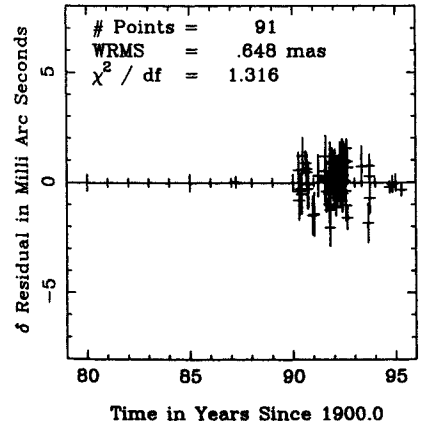
Arc Solution for 1508+572 : δ



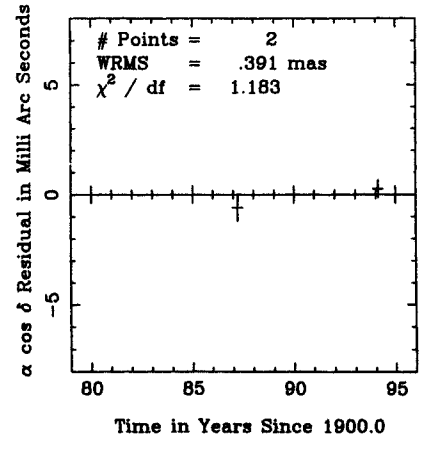
Arc Solution for 1510−089 : $\alpha \cos \delta$



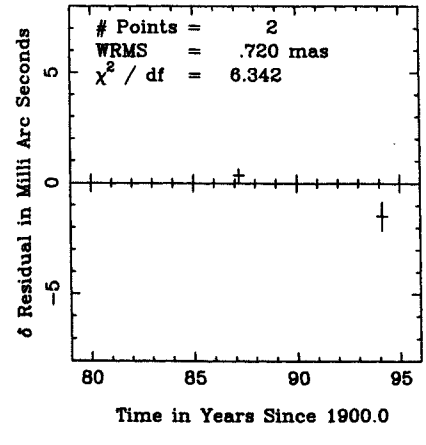
Arc Solution for 1510−089 : δ



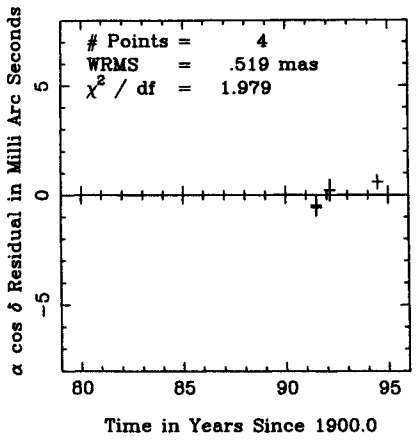
Arc Solution for 1511−100 : $\alpha \cos \delta$



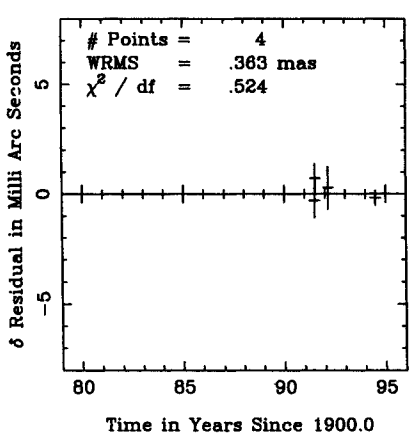
Arc Solution for 1511−100 : δ



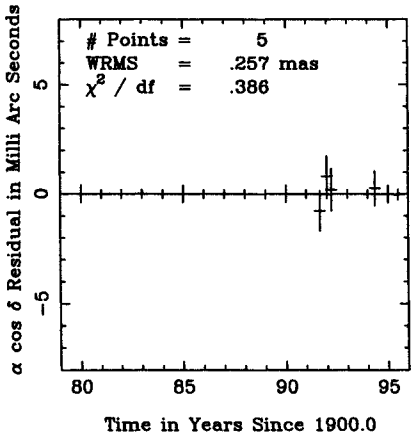
Arc Solution for 1514+197 : $\alpha \cos \delta$



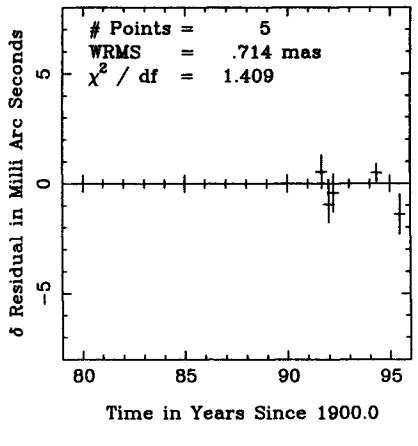
Arc Solution for 1514+197 : δ



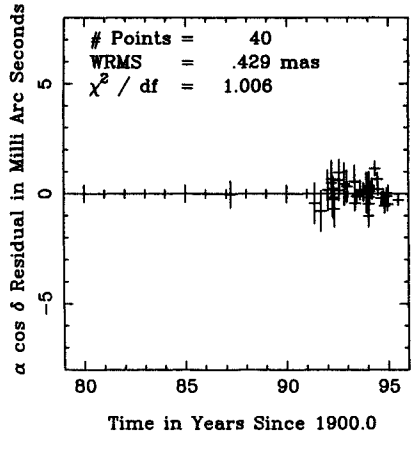
Arc Solution for 1514−241 : $\alpha \cos \delta$



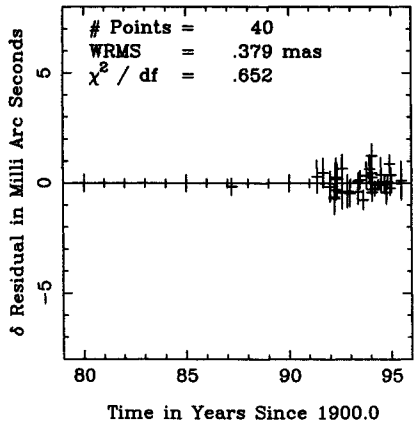
Arc Solution for 1514−241 : δ



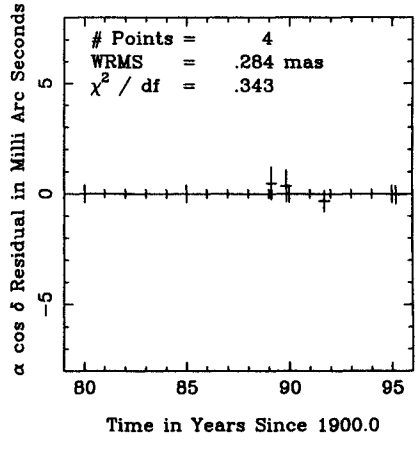
Arc Solution for 1519−273 : $\alpha \cos \delta$



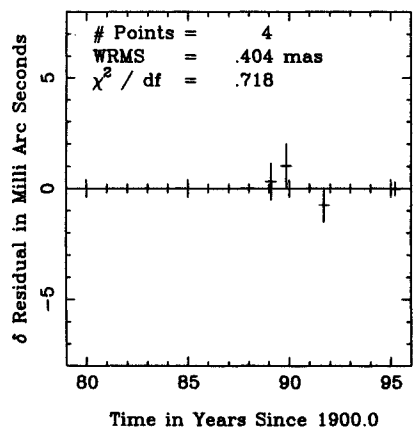
Arc Solution for 1519−273 : δ



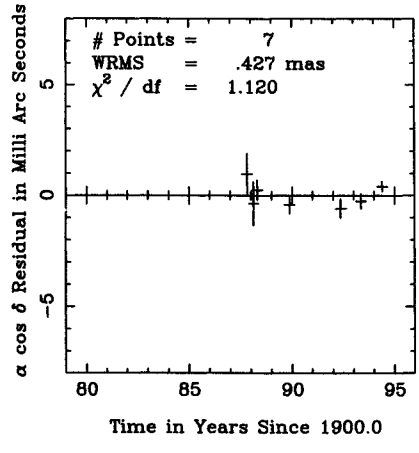
Arc Solution for 1538+149 : $\alpha \cos \delta$



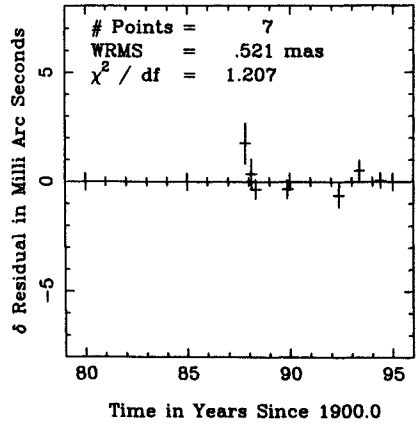
Arc Solution for 1538+149 : δ



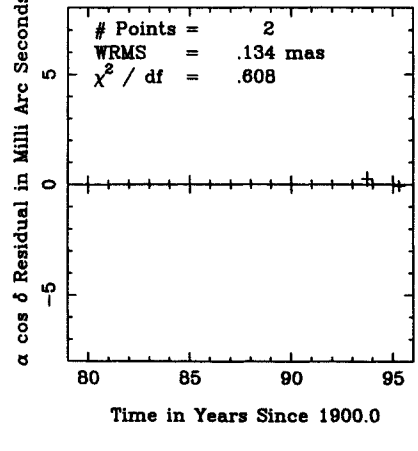
Arc Solution for 1547+507 : $\alpha \cos \delta$



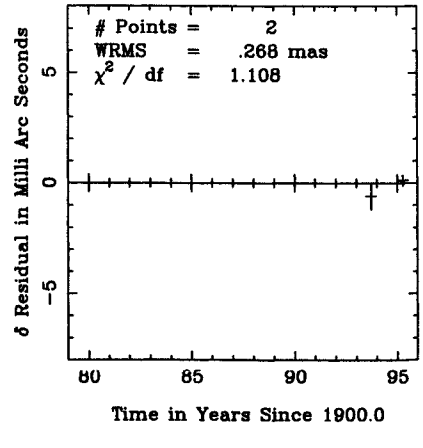
Arc Solution for 1547+507 : δ



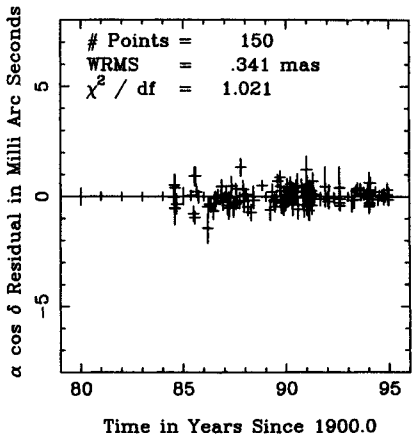
Arc Solution for 1546+027 : $\alpha \cos \delta$



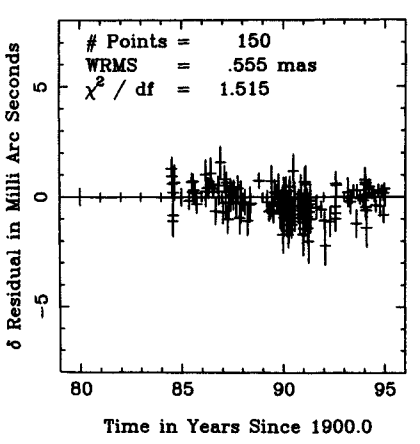
Arc Solution for 1546+027 : δ



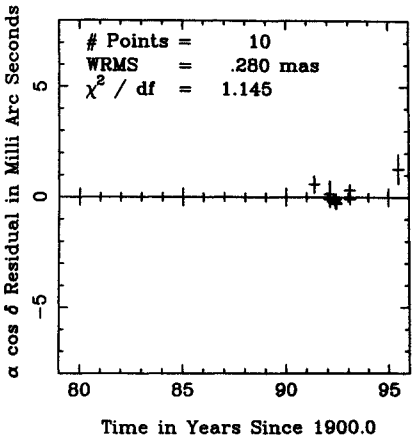
Arc Solution for 1548+056 : $\alpha \cos \delta$



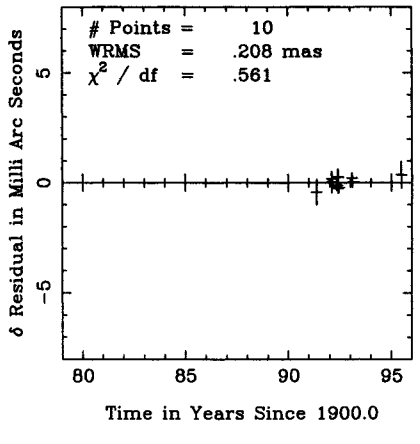
Arc Solution for 1548+056 : δ



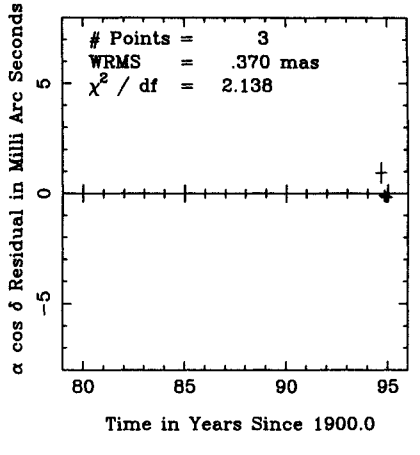
Arc Solution for 1549−790 : $\alpha \cos \delta$



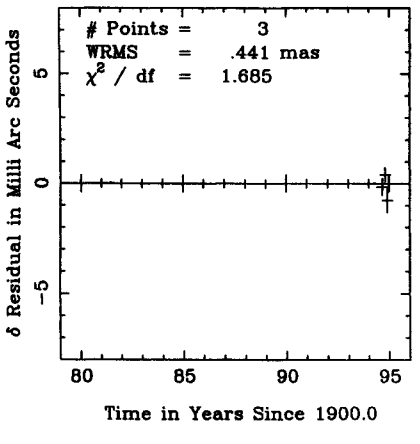
Arc Solution for 1549−790 : δ



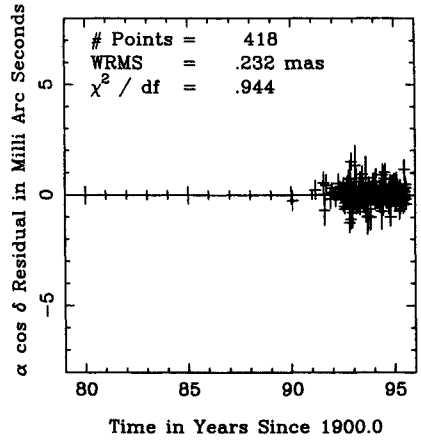
Arc Solution for 1557+032 : $\alpha \cos \delta$



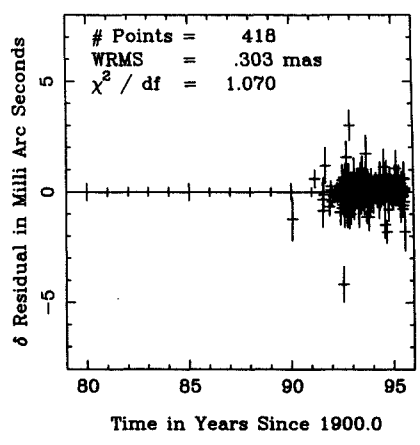
Arc Solution for 1557+032 : δ



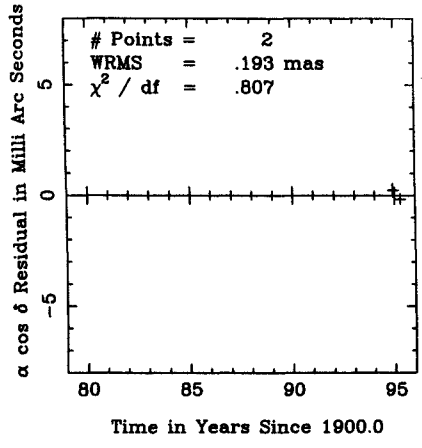
Arc Solution for 1606+106 : $\alpha \cos \delta$



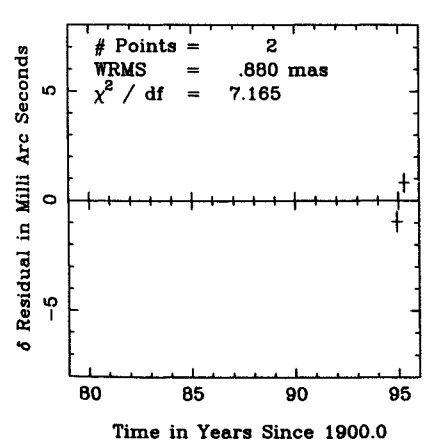
Arc Solution for 1606+106 : δ



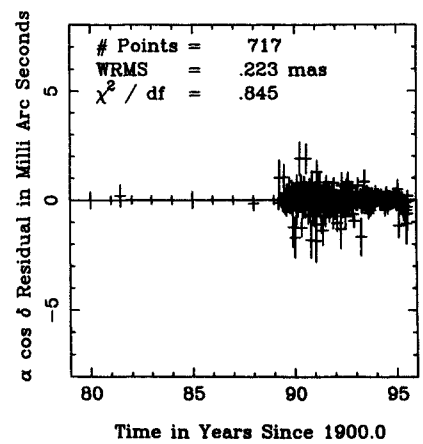
Arc Solution for 1607+268 : $\alpha \cos \delta$



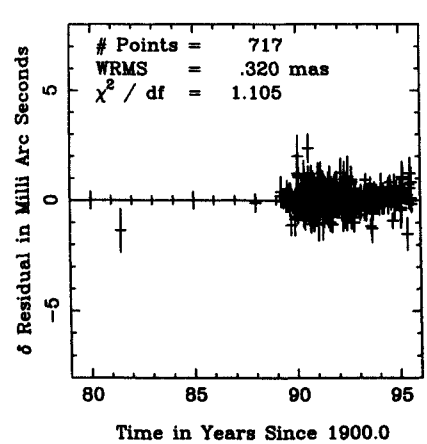
Arc Solution for 1607+268 : δ



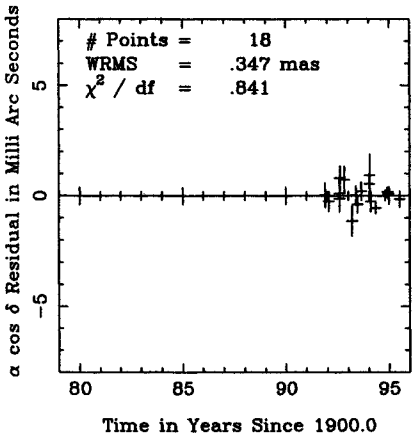
Arc Solution for 1611+343 : $\alpha \cos \delta$



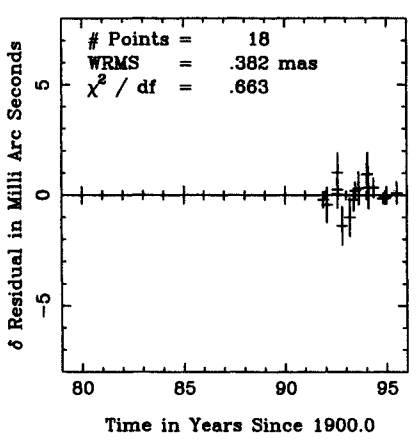
Arc Solution for 1611+343 : δ



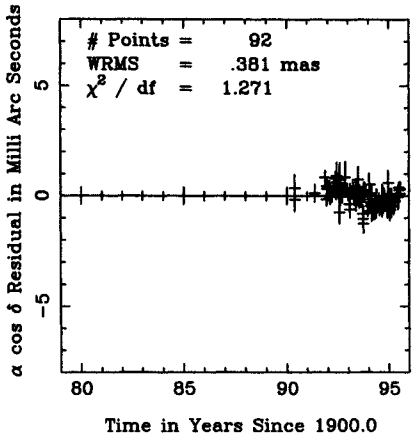
Arc Solution for 1614+051 : α cos δ



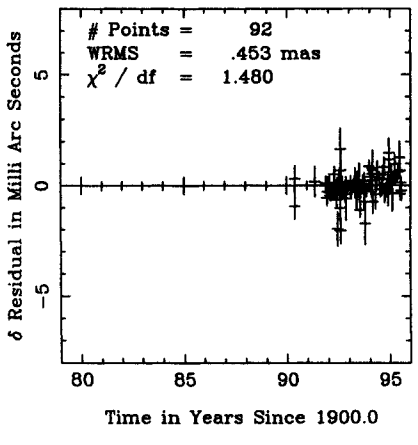
Arc Solution for 1614+051 : δ



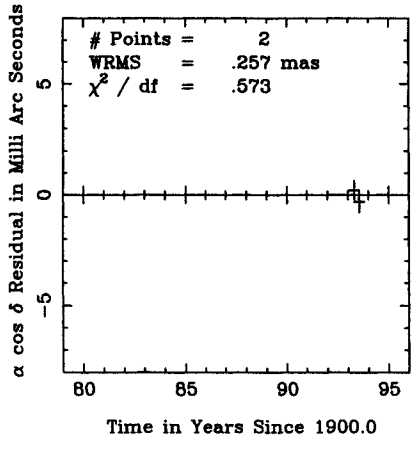
Arc Solution for 1610−771 : α cos δ



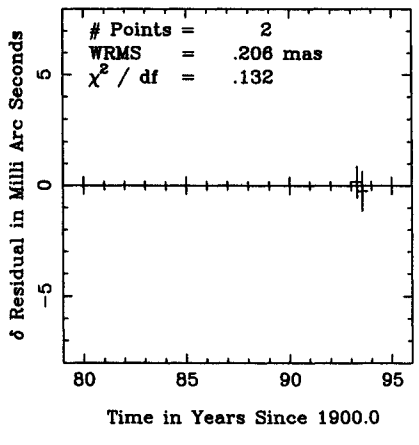
Arc Solution for 1610−771 : δ



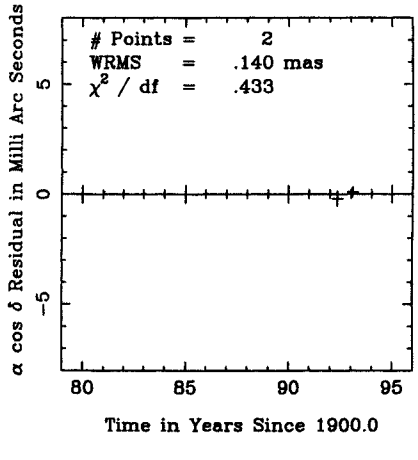
Arc Solution for 1616+063 : α cos δ



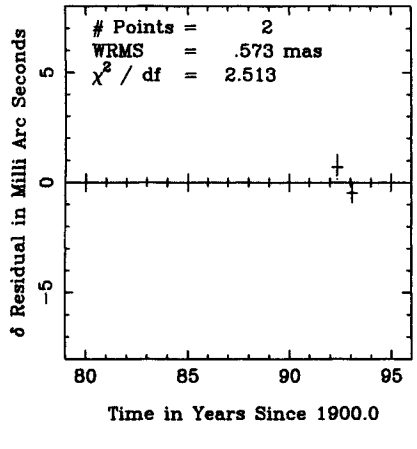
Arc Solution for 1616+063 : δ



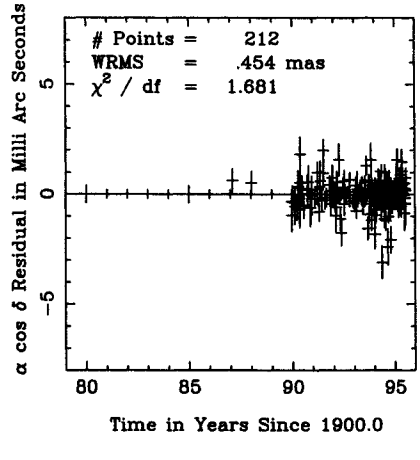
Arc Solution for 1619−680 : α cos δ



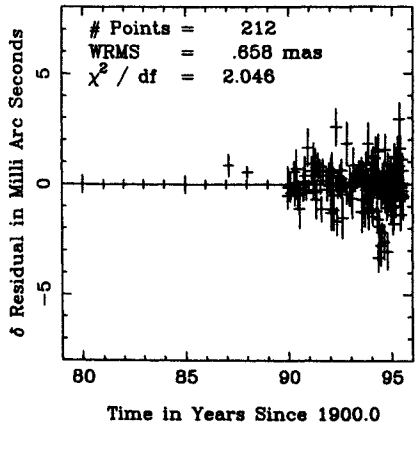
Arc Solution for 1619−680 : δ



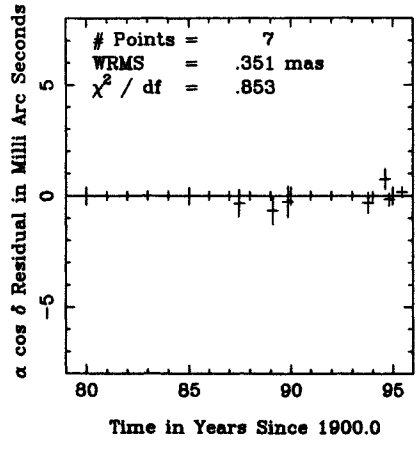
Arc Solution for 1622−253 : α cos δ



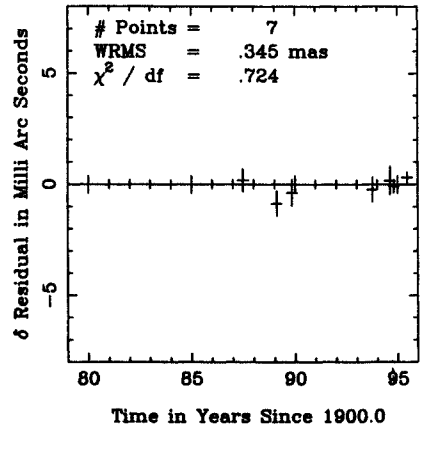
Arc Solution for 1622−253 : δ



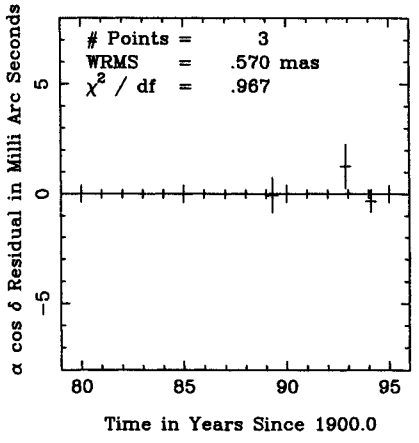
Arc Solution for 1624+416 : α cos δ



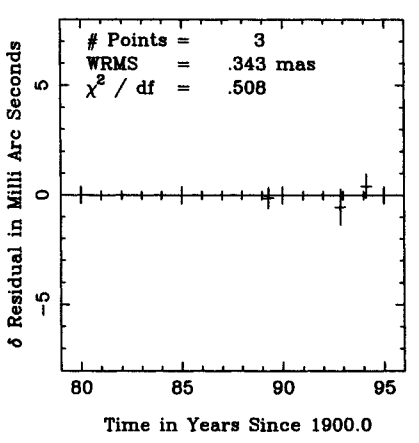
Arc Solution for 1624+416 : δ



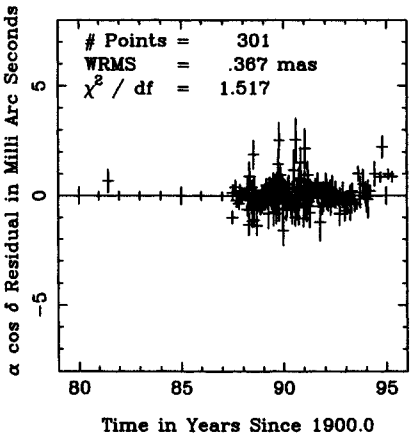
Arc Solution for 1622−297 : α cos δ



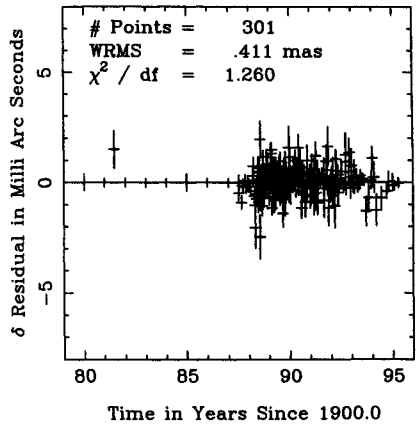
Arc Solution for 1622−297 : δ



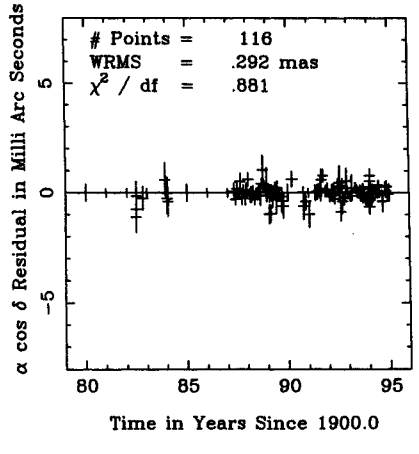
Arc Solution for 1633+382 : α cos δ



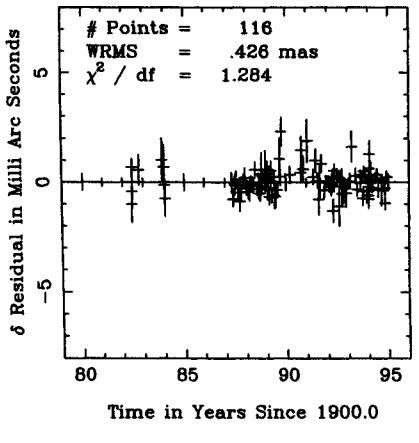
Arc Solution for 1633+382 : δ



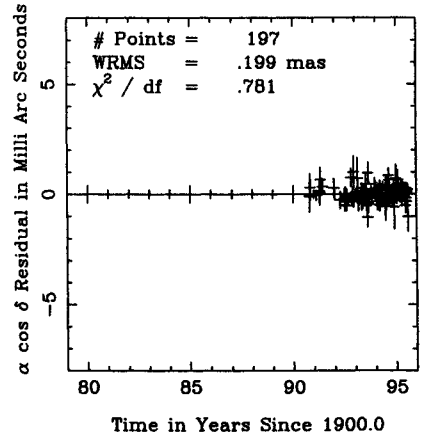
Arc Solution for 1637+574 : α cos δ



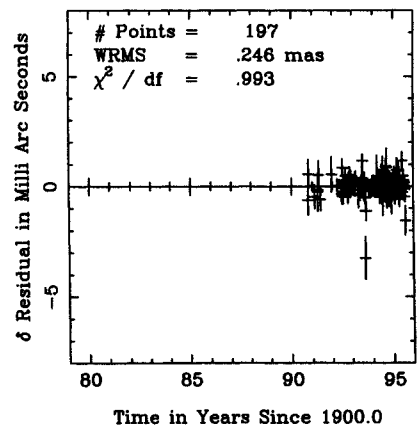
Arc Solution for 1637+574 : δ



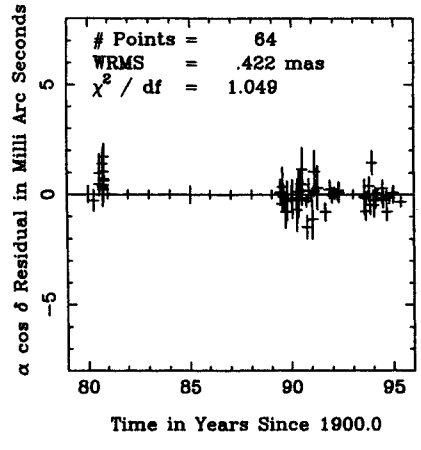
Arc Solution for 1638+398 : α cos δ



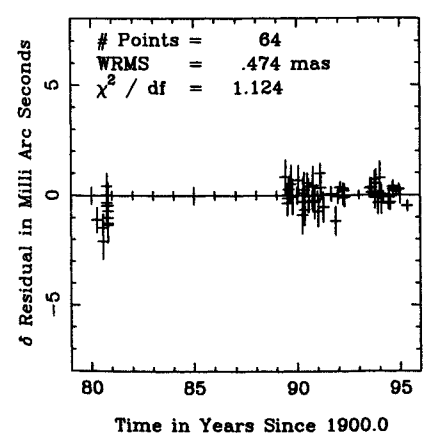
Arc Solution for 1638+398 : δ



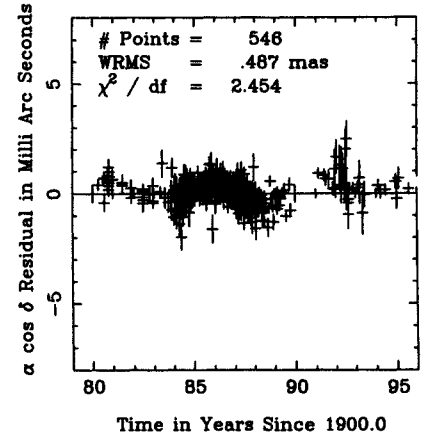
Arc Solution for 1642+690 : α cos δ



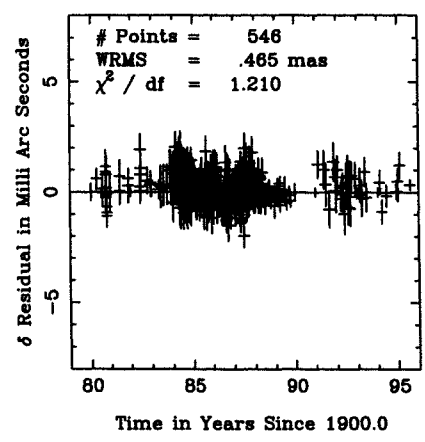
Arc Solution for 1642+690 : δ



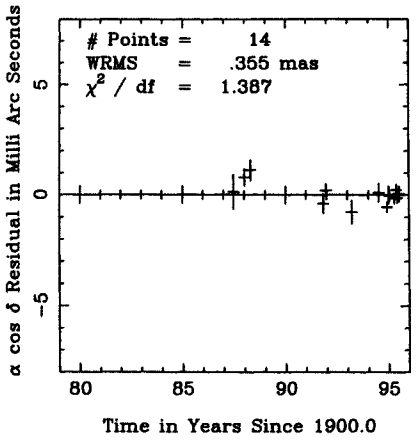
Arc Solution for 1641+399 : α cos δ



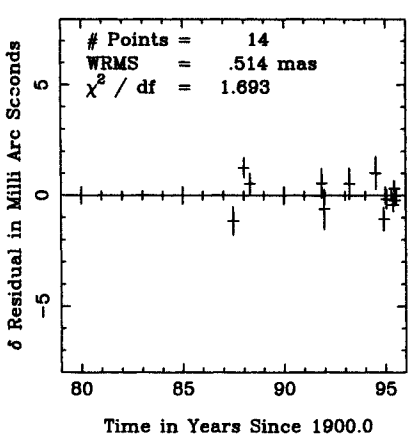
Arc Solution for 1641+399 : δ



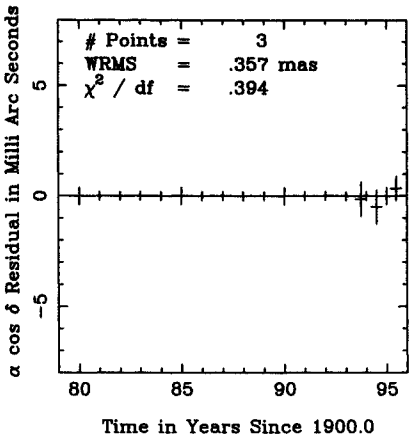
Arc Solution for 1652+398 : $\alpha \cos \delta$



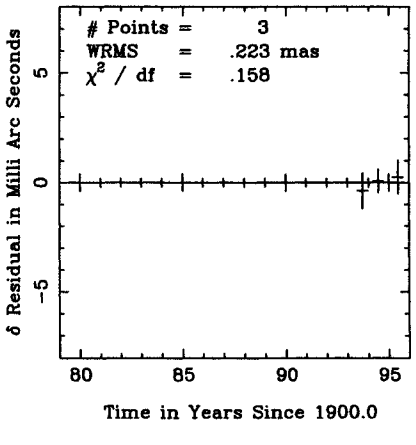
Arc Solution for 1652+398 : δ



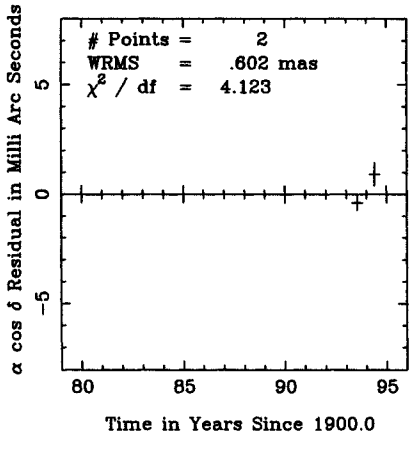
Arc Solution for 1656+348 : $\alpha \cos \delta$



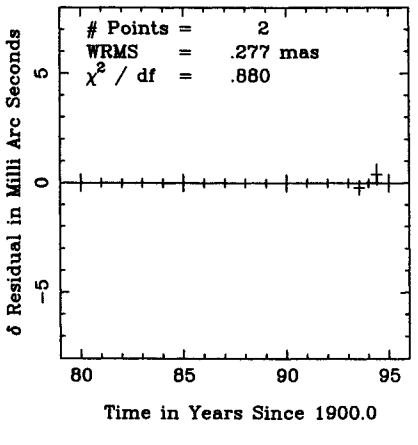
Arc Solution for 1656+348 : δ



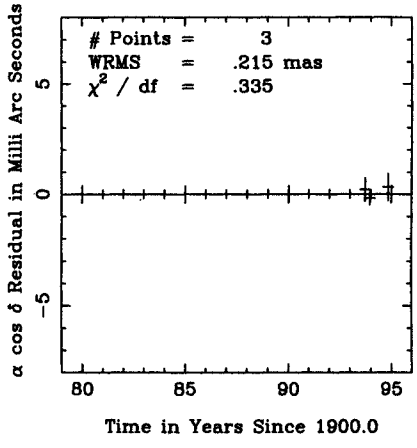
Arc Solution for 1656+477 : $\alpha \cos \delta$



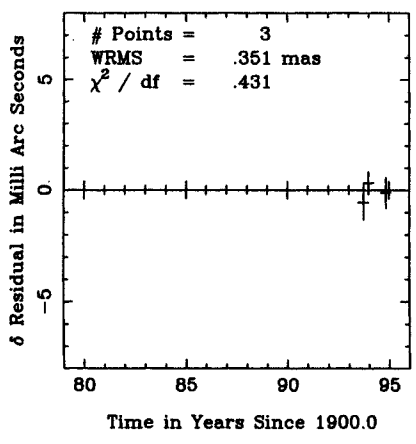
Arc Solution for 1656+477 : δ



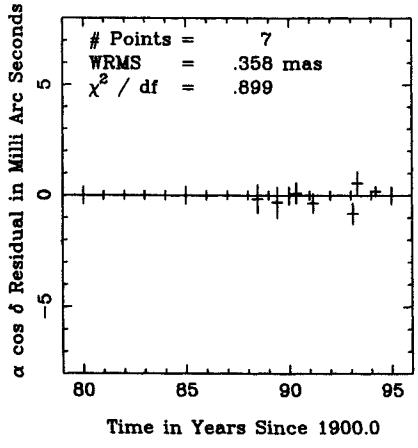
Arc Solution for 1655+077 : $\alpha \cos \delta$



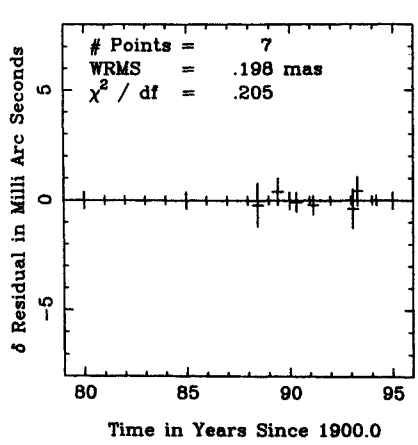
Arc Solution for 1655+077 : δ



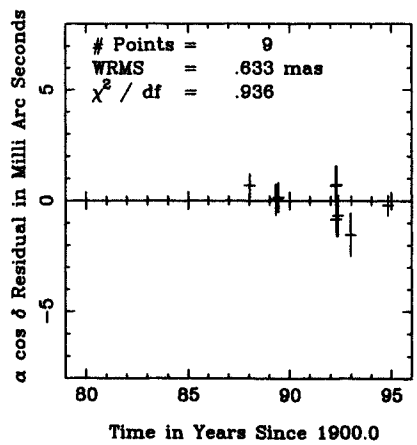
Arc Solution for 1656+053 : $\alpha \cos \delta$



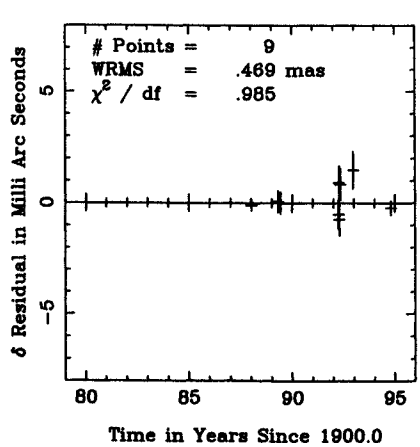
Arc Solution for 1656+053 : δ



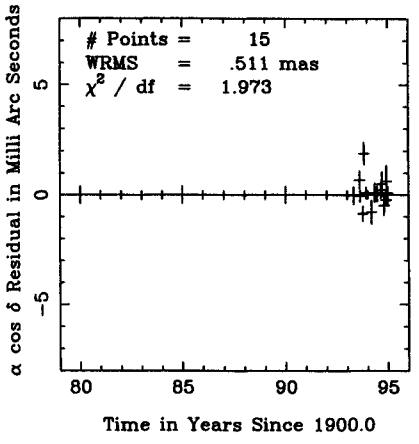
Arc Solution for 1657-261 : $\alpha \cos \delta$



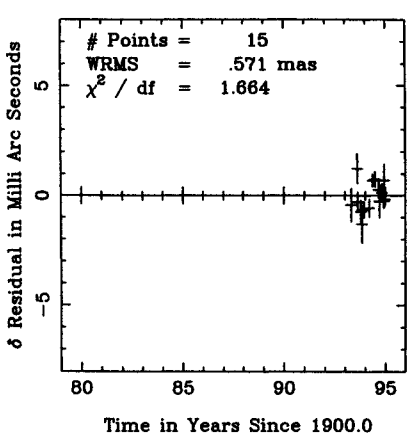
Arc Solution for 1657-261 : δ



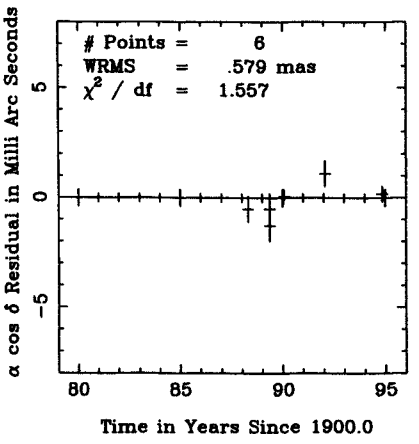
Arc Solution for 1705+018 : $\alpha \cos \delta$



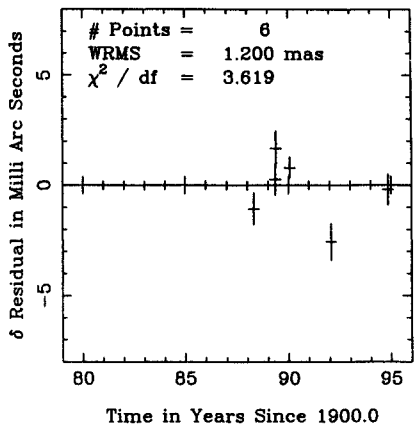
Arc Solution for 1705+018 : δ



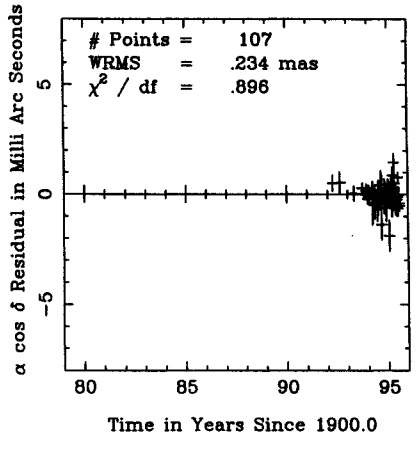
Arc Solution for 1717+178 : $\alpha \cos \delta$



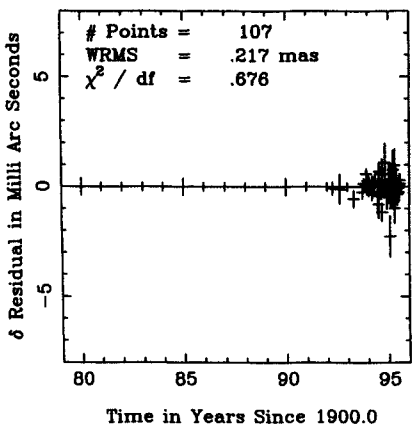
Arc Solution for 1717+178 : δ



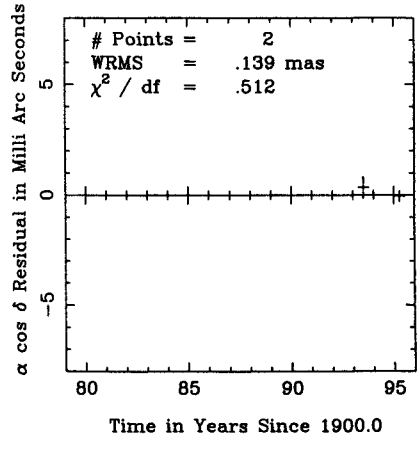
Arc Solution for 1726+455 : $\alpha \cos \delta$



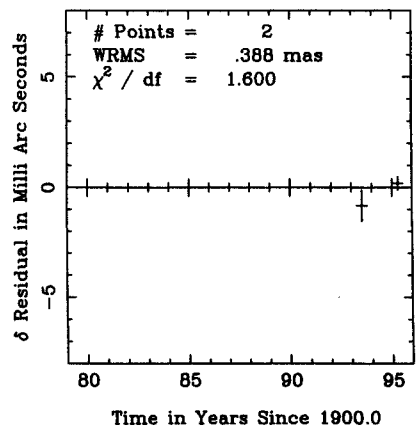
Arc Solution for 1726+455 : δ



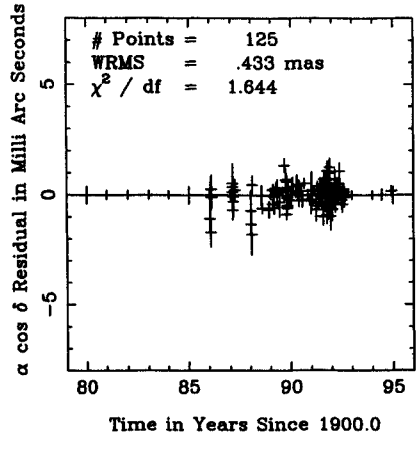
Arc Solution for 1725+044 : $\alpha \cos \delta$



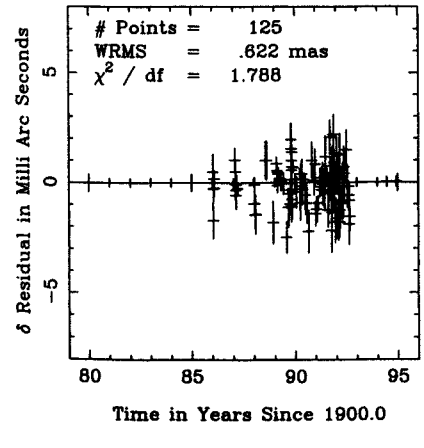
Arc Solution for 1725+044 : δ



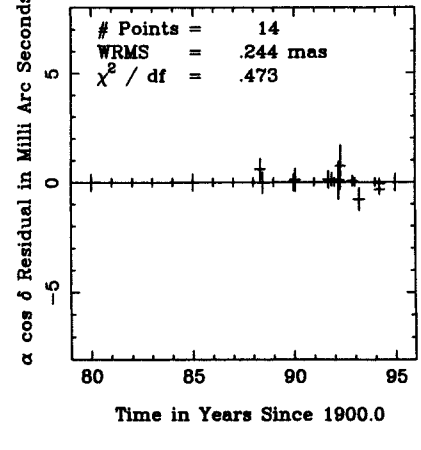
Arc Solution for 1730−130 : $\alpha \cos \delta$



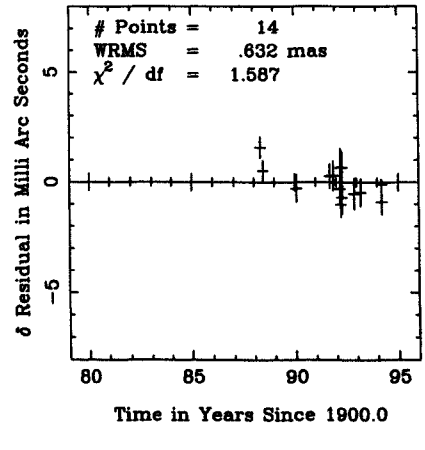
Arc Solution for 1730−130 : δ



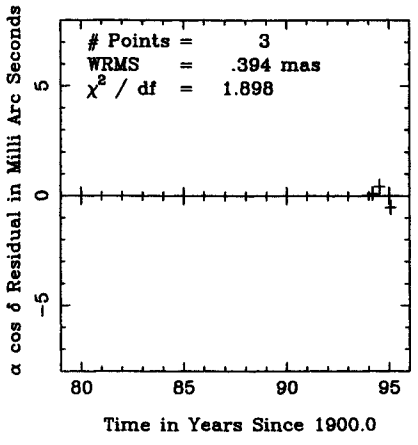
Arc Solution for 1732+389 : $\alpha \cos \delta$



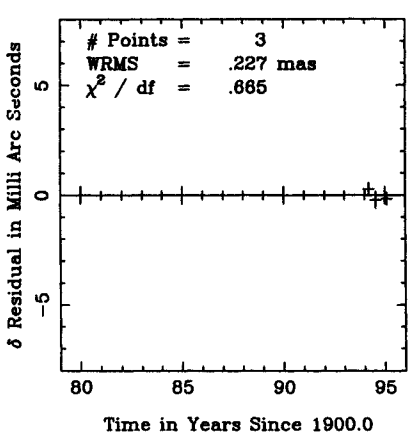
Arc Solution for 1732+389 : δ



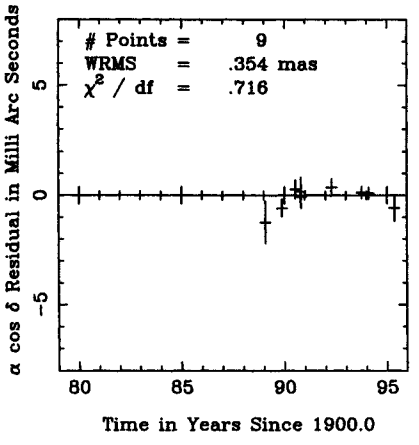
Arc Solution for 1738+499 : $\alpha \cos \delta$



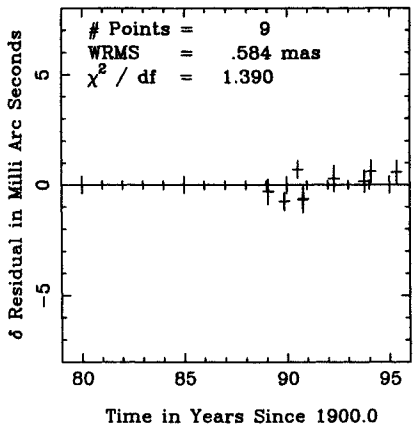
Arc Solution for 1738+499 : δ



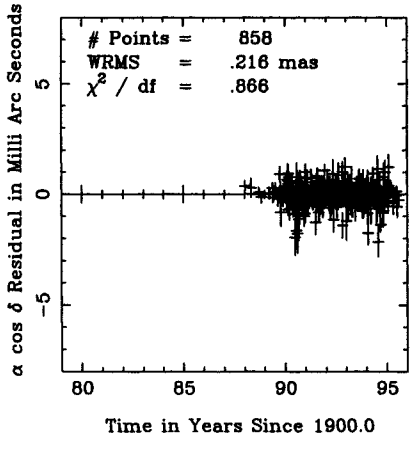
Arc Solution for 1738+476 : $\alpha \cos \delta$



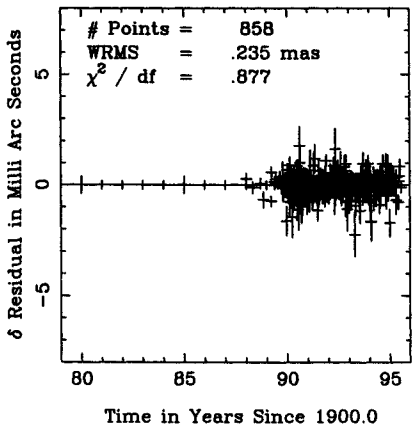
Arc Solution for 1738+476 : δ



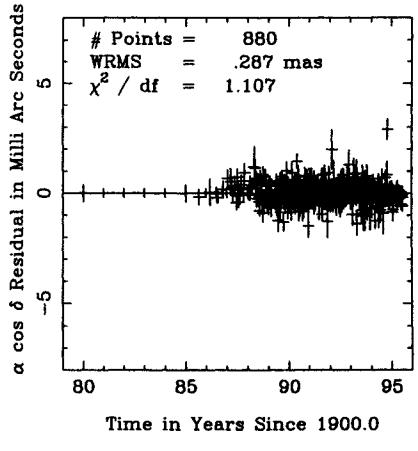
Arc Solution for 1739+522 : $\alpha \cos \delta$



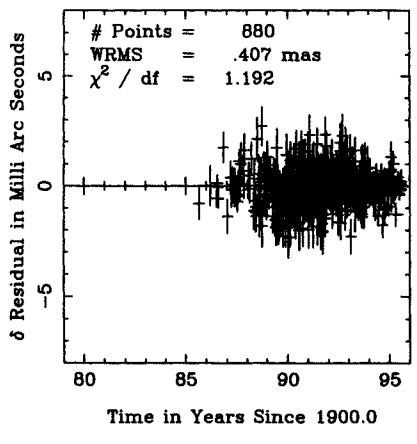
Arc Solution for 1739+522 : δ



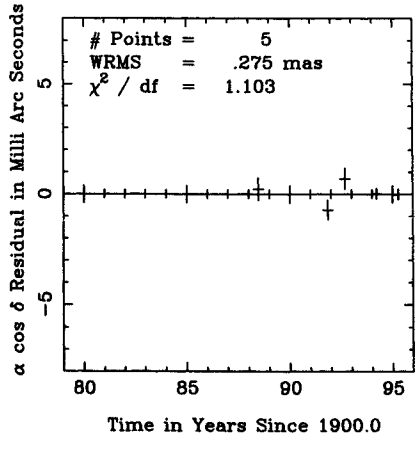
Arc Solution for 1741−038 : $\alpha \cos \delta$



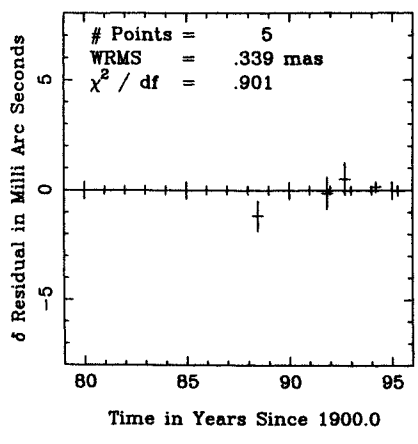
Arc Solution for 1741−038 : δ



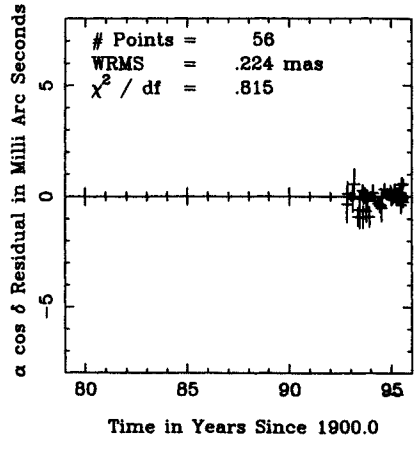
Arc Solution for 1743+173 : $\alpha \cos \delta$



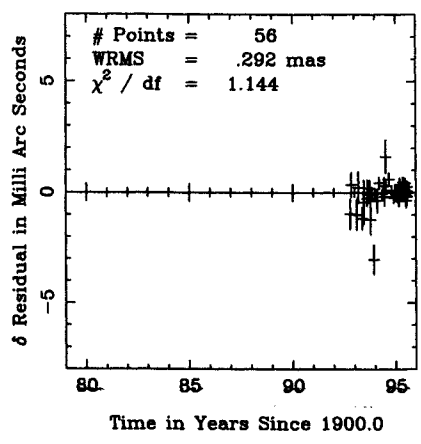
Arc Solution for 1743+173 : δ



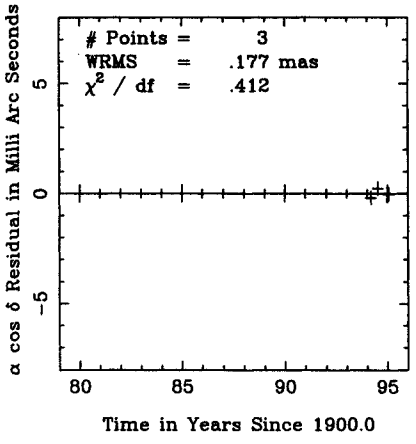
Arc Solution for 1745+624 : $\alpha \cos \delta$



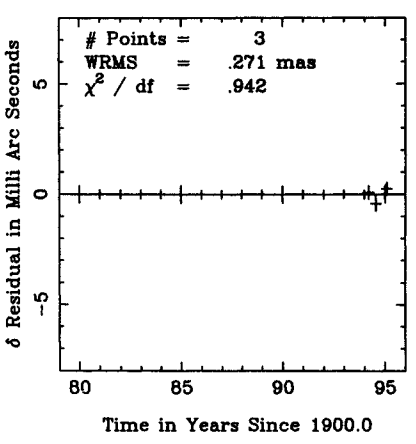
Arc Solution for 1745+624 : δ



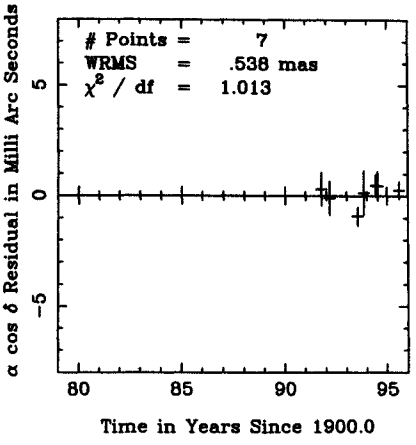
Arc Solution for 1746+470 : $\alpha \cos \delta$



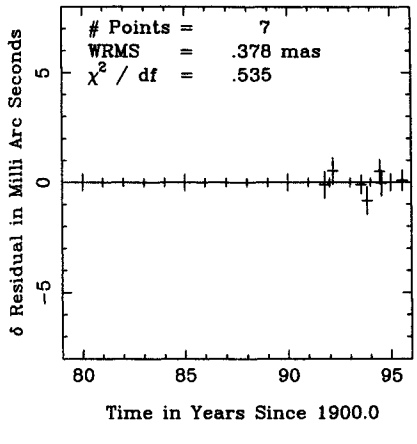
Arc Solution for 1746+470 : δ



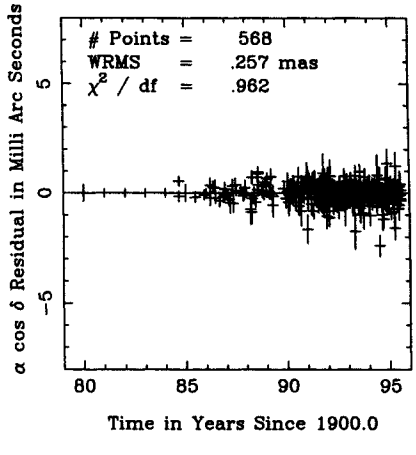
Arc Solution for 1749+701 : $\alpha \cos \delta$



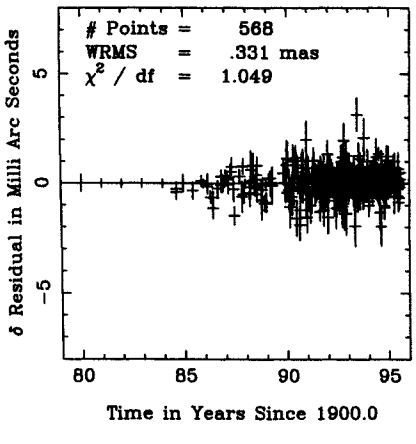
Arc Solution for 1749+701 : δ



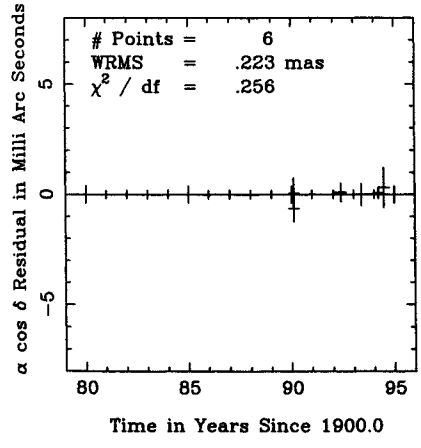
Arc Solution for 1749+096 : $\alpha \cos \delta$



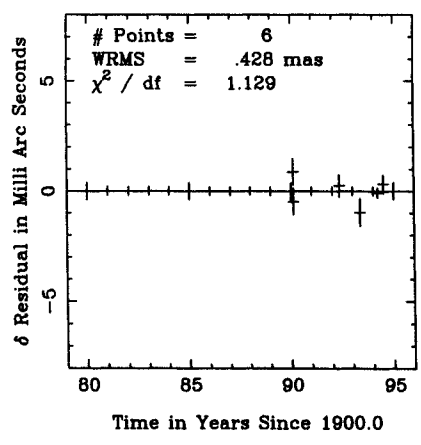
Arc Solution for 1749+096 : δ



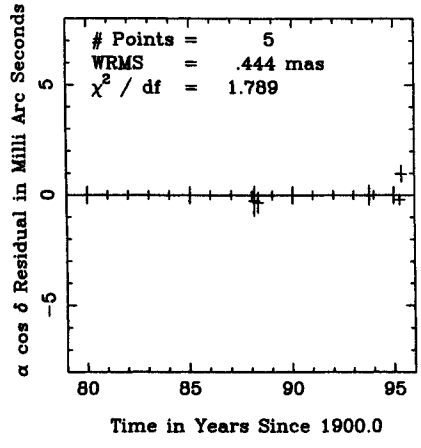
Arc Solution for 1751+441 : $\alpha \cos \delta$



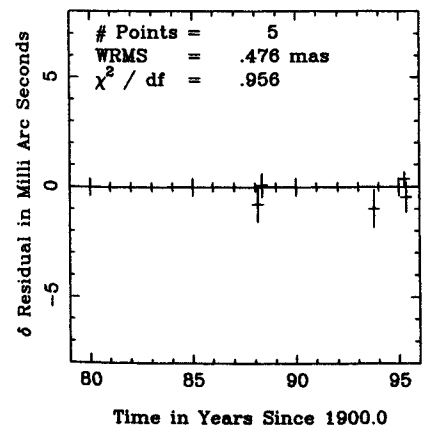
Arc Solution for 1751+441 : δ



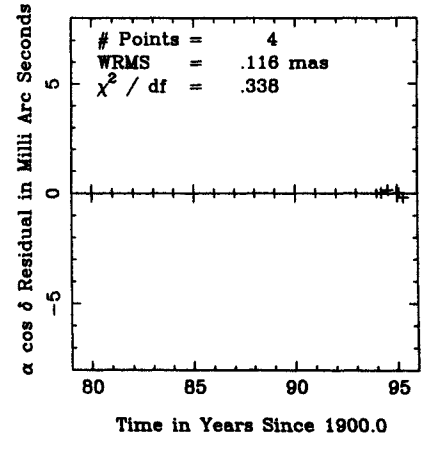
Arc Solution for 1751+288 : $\alpha \cos \delta$



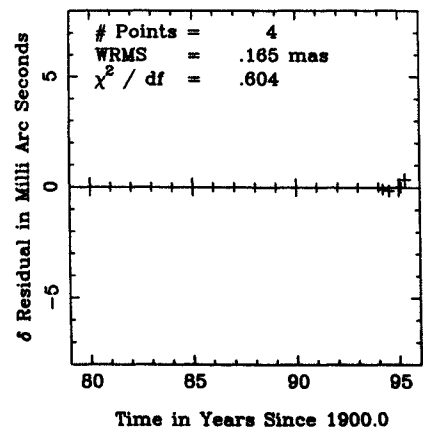
Arc Solution for 1751+288 : δ



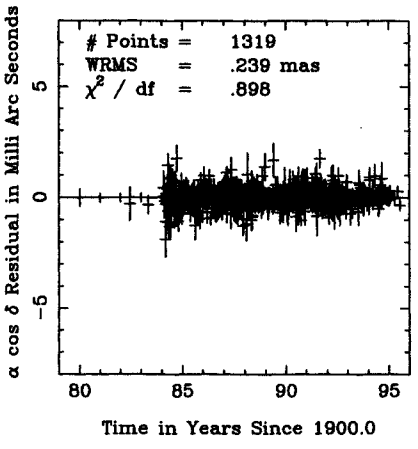
Arc Solution for 1758+388 : $\alpha \cos \delta$



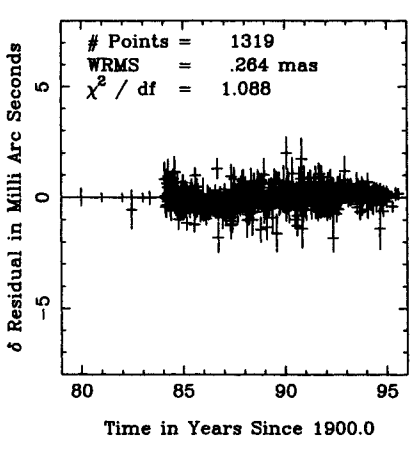
Arc Solution for 1758+388 : δ



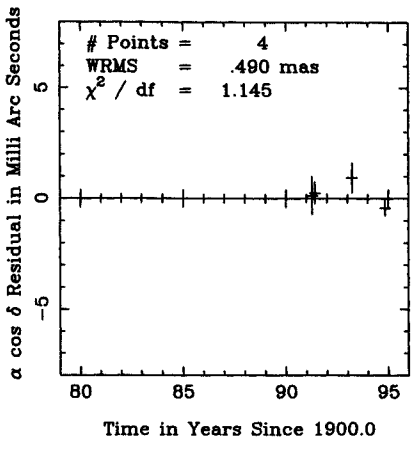
Arc Solution for 1803+784 : α cos δ



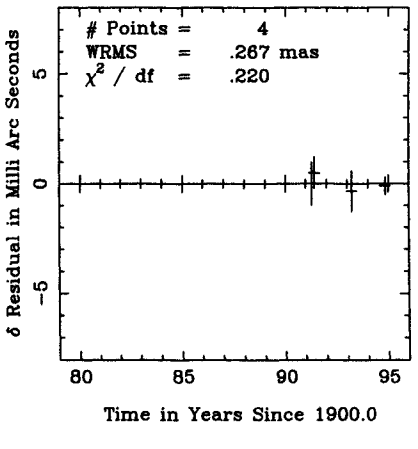
Arc Solution for 1803+784 : δ



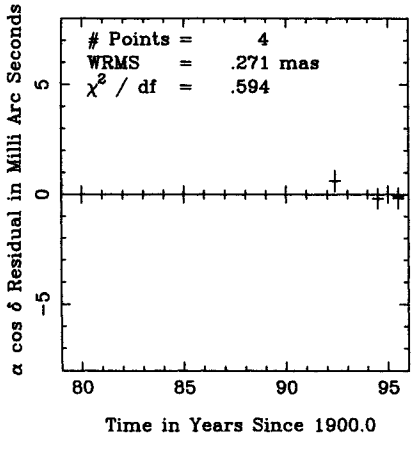
Arc Solution for 1800+440 : α cos δ



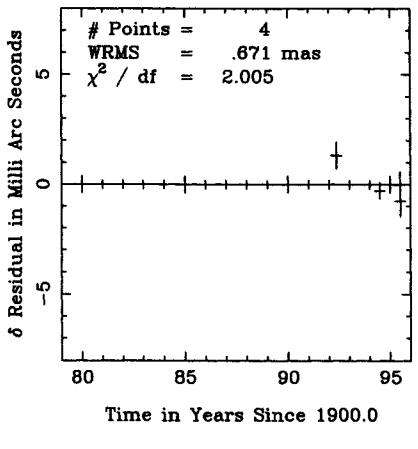
Arc Solution for 1800+440 : δ



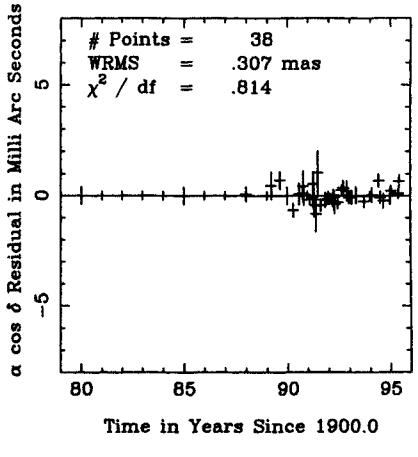
Arc Solution for 1758−651 : α cos δ



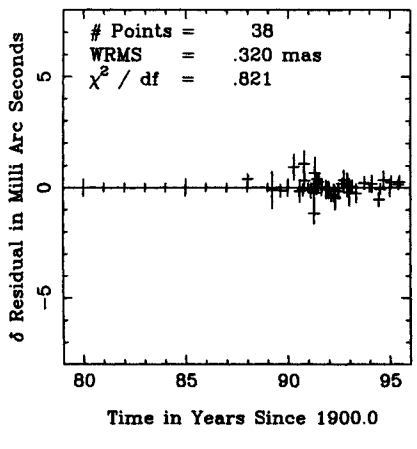
Arc Solution for 1758−651 : δ



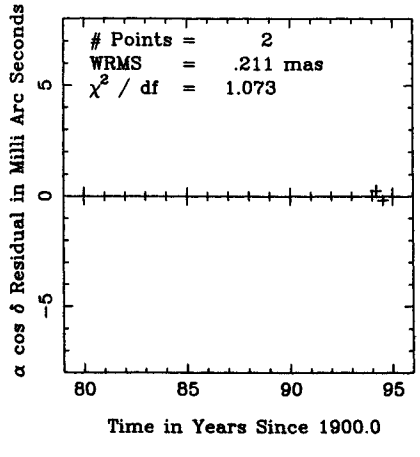
Arc Solution for 1807+698 : α cos δ



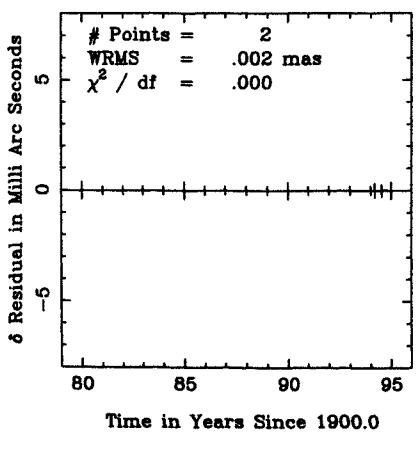
Arc Solution for 1807+698 : δ



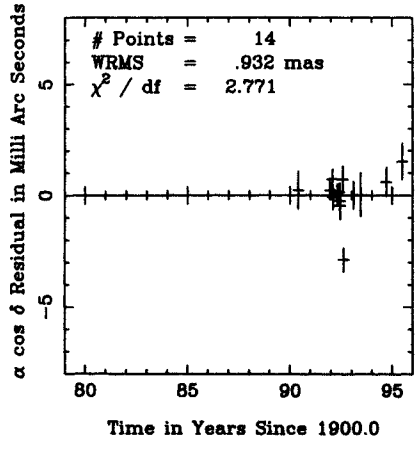
Arc Solution for 1806+456 : α cos δ



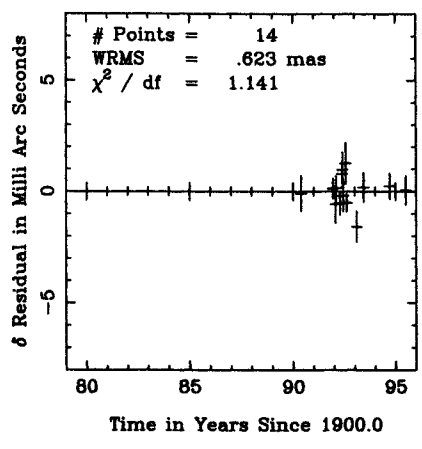
Arc Solution for 1806+456 : δ



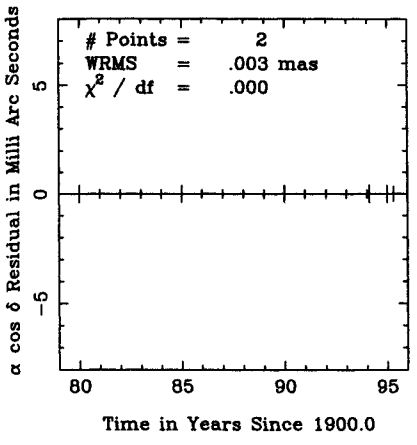
Arc Solution for 1815−553 : α cos δ



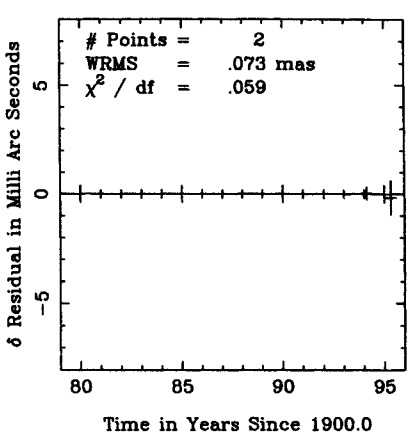
Arc Solution for 1815−553 : δ



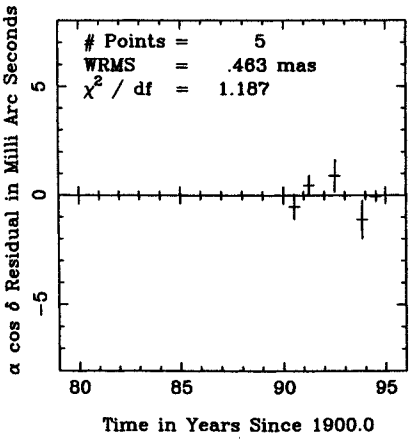
Arc Solution for 1817−254 : α cos δ



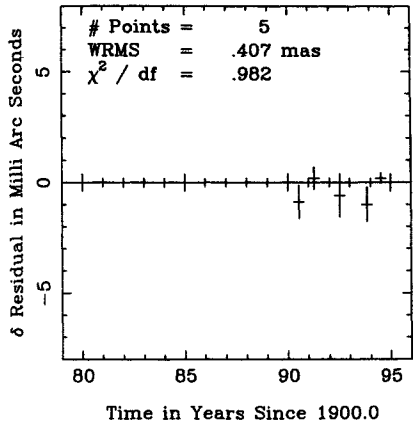
Arc Solution for 1817−254 : δ



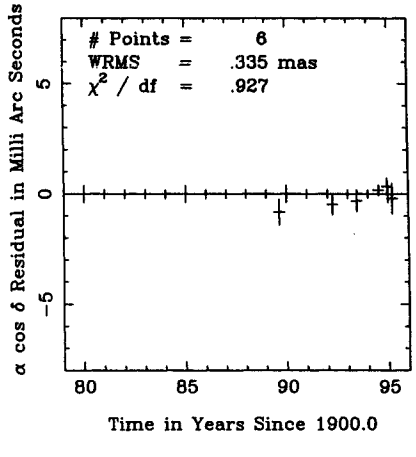
Arc Solution for 1826+796 : α cos δ



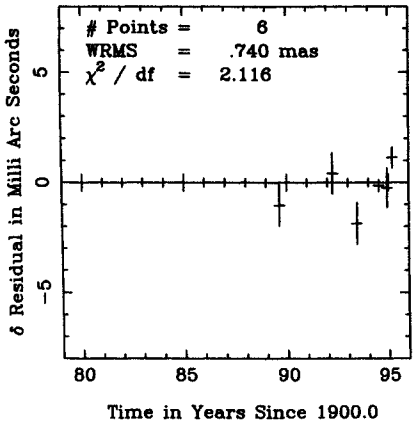
Arc Solution for 1826+796 : δ



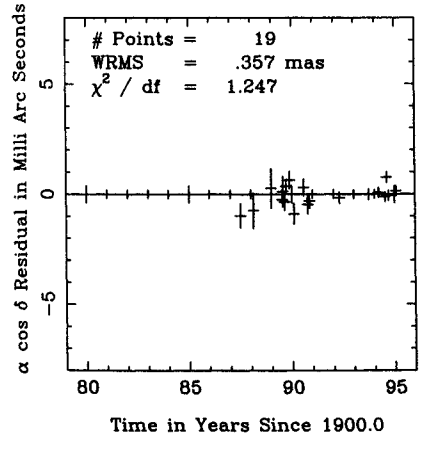
Arc Solution for 1821+107 : α cos δ



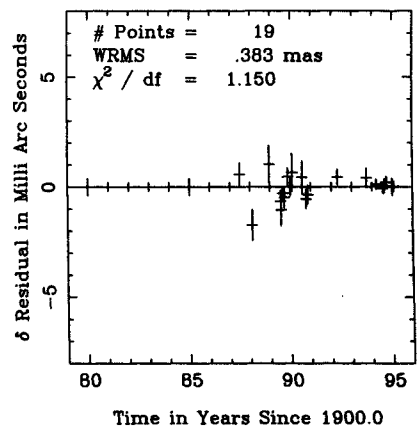
Arc Solution for 1821+107 : δ



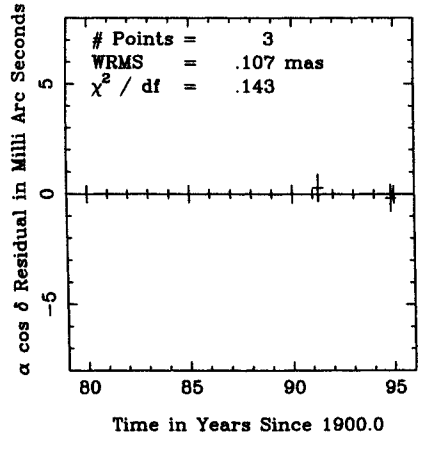
Arc Solution for 1823+568 : α cos δ



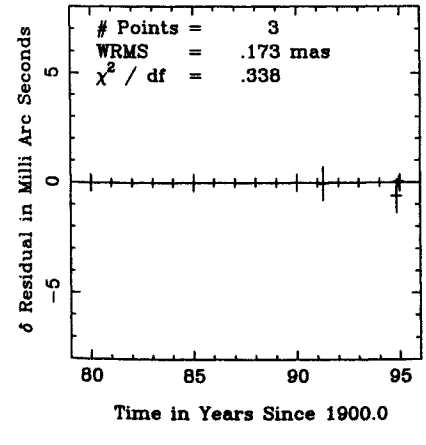
Arc Solution for 1823+568 : δ



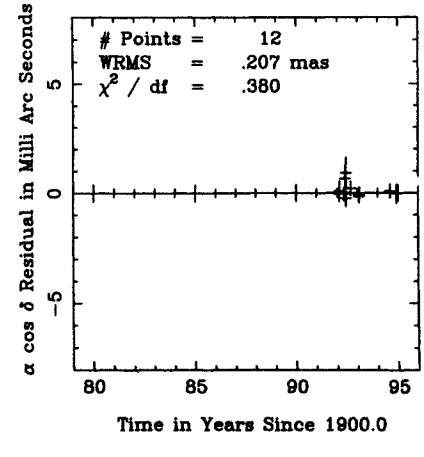
Arc Solution for 1830+285 : α cos δ



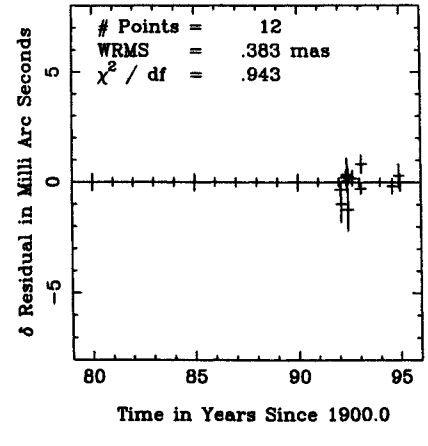
Arc Solution for 1830+285 : δ



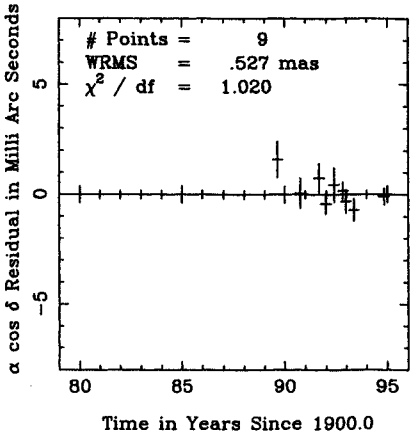
Arc Solution for 1831−711 : α cos δ



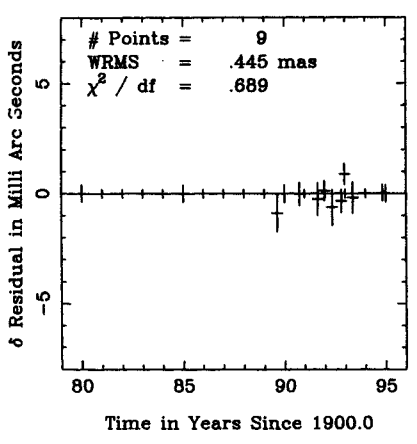
Arc Solution for 1831−711 : δ



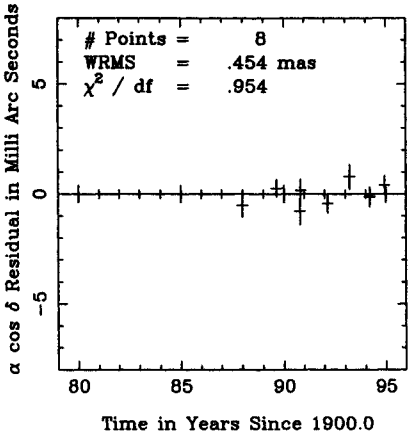
Arc Solution for 1845+797 : $\alpha \cos \delta$



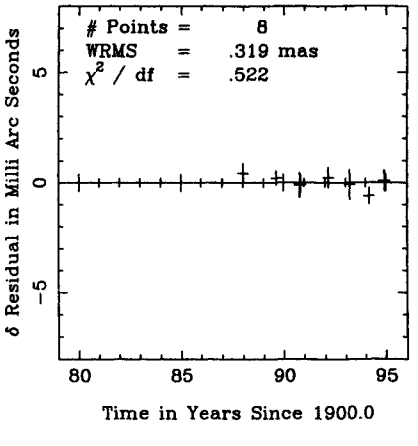
Arc Solution for 1845+797 : δ



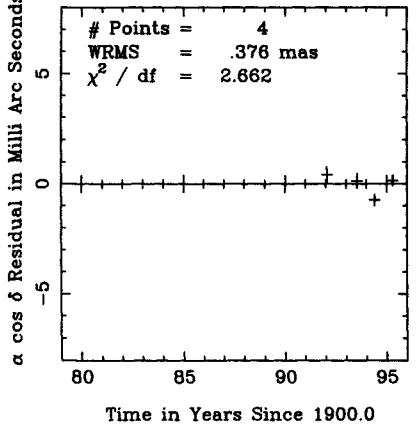
Arc Solution for 1842+681 : $\alpha \cos \delta$



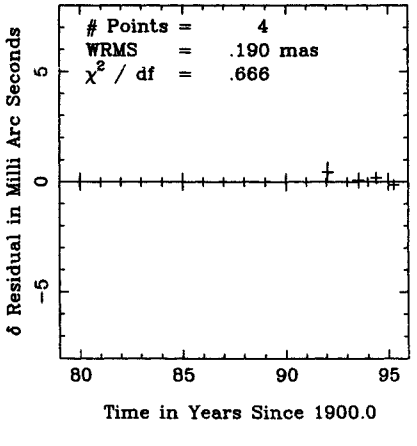
Arc Solution for 1842+681 : δ



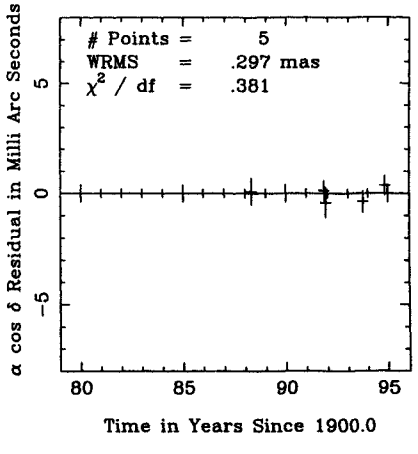
Arc Solution for 1849+670 : $\alpha \cos \delta$



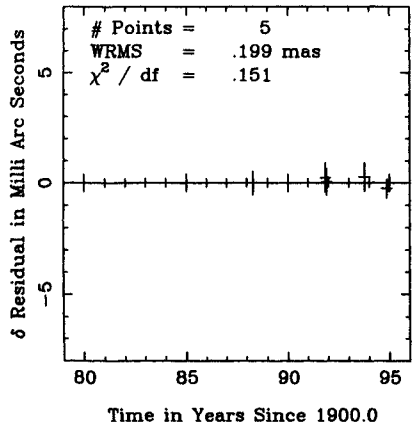
Arc Solution for 1849+670 : δ



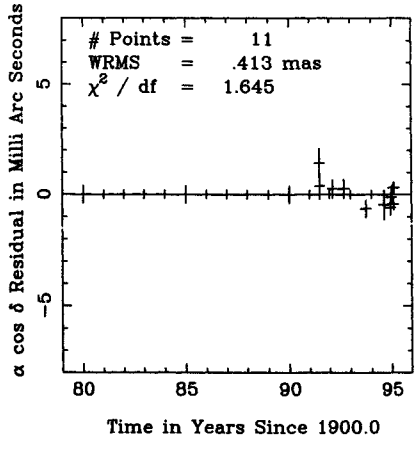
Arc Solution for 1856+737 : $\alpha \cos \delta$



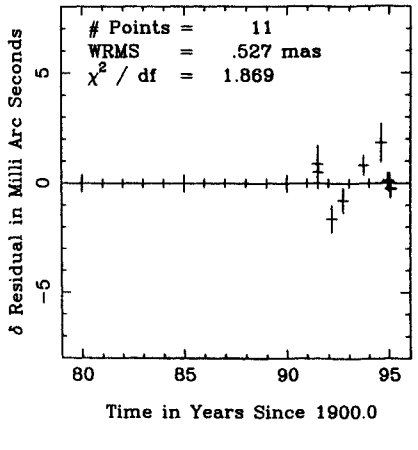
Arc Solution for 1856+737 : δ



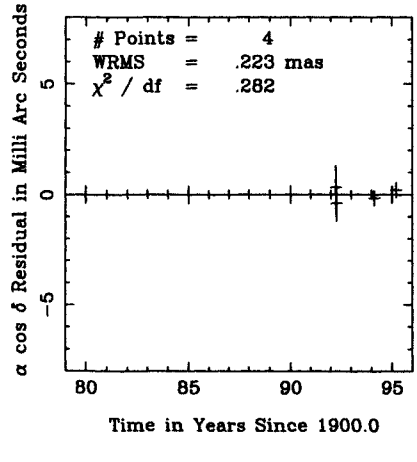
Arc Solution for 1901+319 : $\alpha \cos \delta$



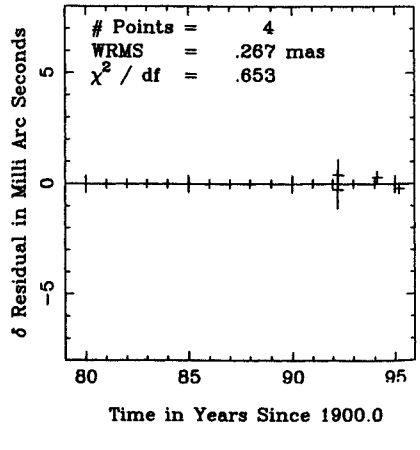
Arc Solution for 1901+319 : δ



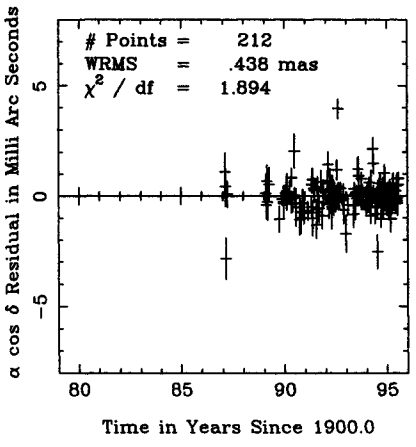
Arc Solution for 1908-201 : $\alpha \cos \delta$



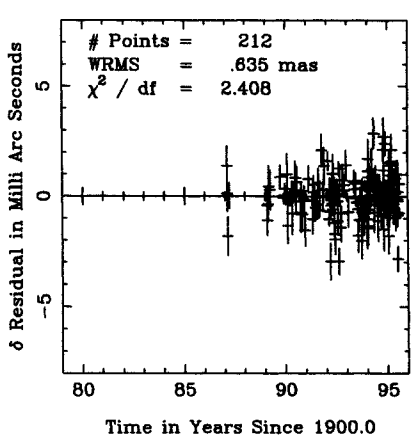
Arc Solution for 1908-201 : δ



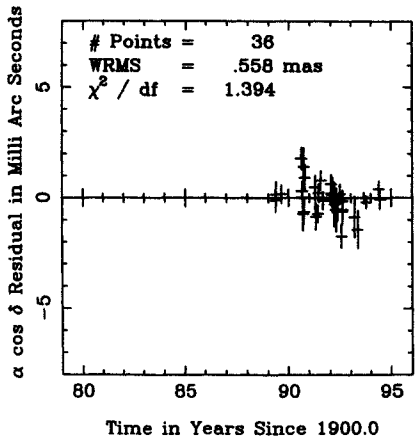
Arc Solution for 1921−293 : α cos δ



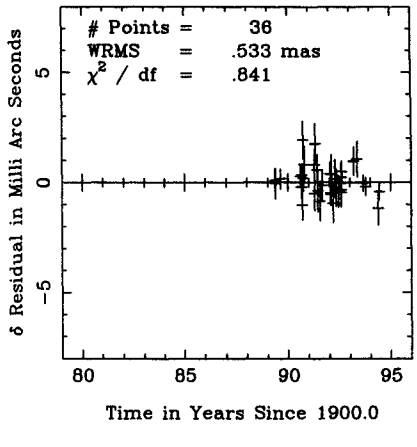
Arc Solution for 1921−293 : δ



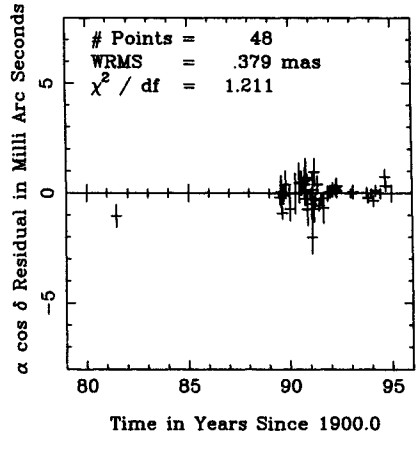
Arc Solution for 1923+210 : α cos δ



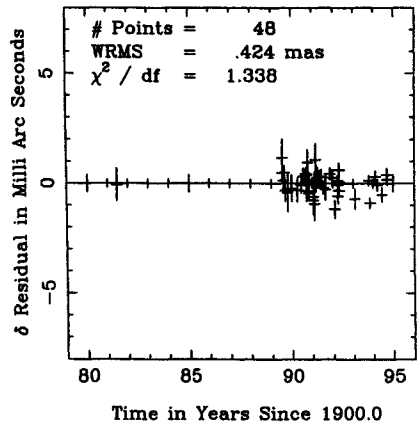
Arc Solution for 1923+210 : δ



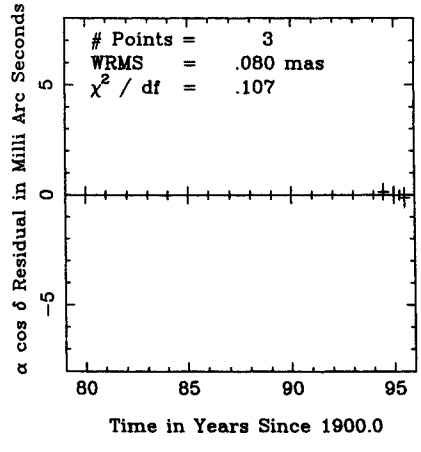
Arc Solution for 1928+738 : α cos δ



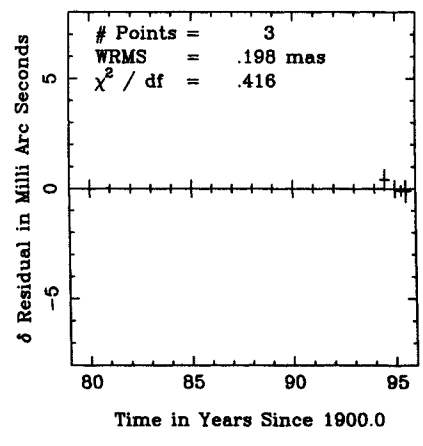
Arc Solution for 1928+738 : δ



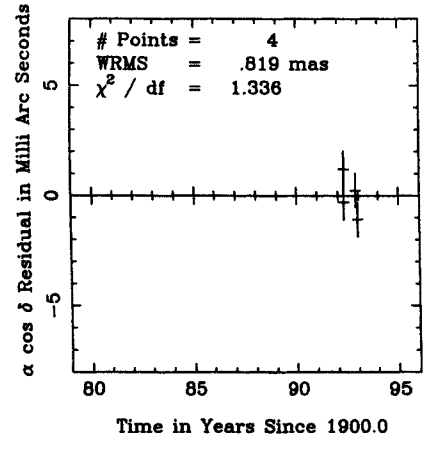
Arc Solution for 1929+226 : α cos δ



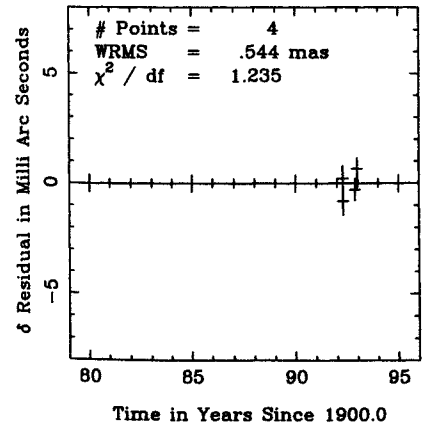
Arc Solution for 1929+226 : δ



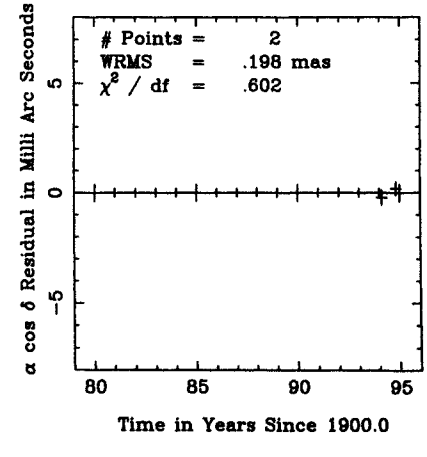
Arc Solution for 1933−400 : α cos δ



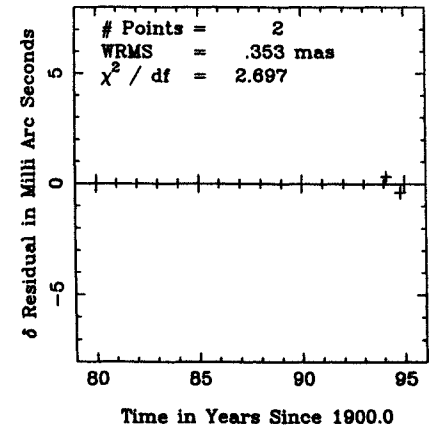
Arc Solution for 1933−400 : δ



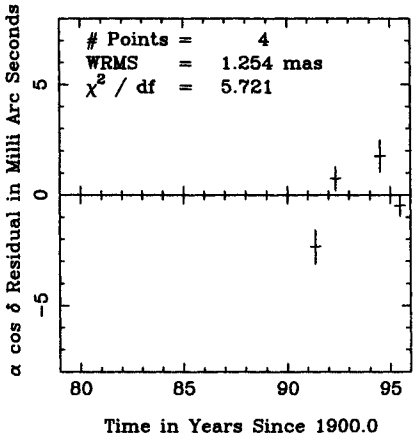
Arc Solution for 1937−101 : α cos δ



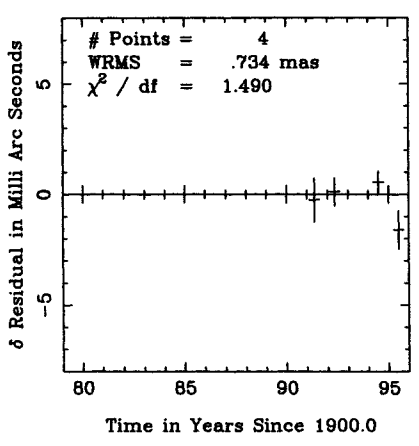
Arc Solution for 1937−101 : δ



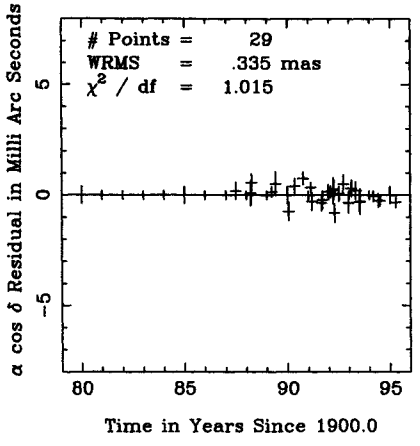
Arc Solution for 1935−692 : $\alpha \cos \delta$



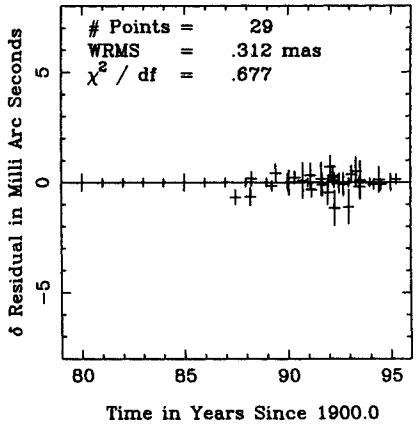
Arc Solution for 1935−692 : δ



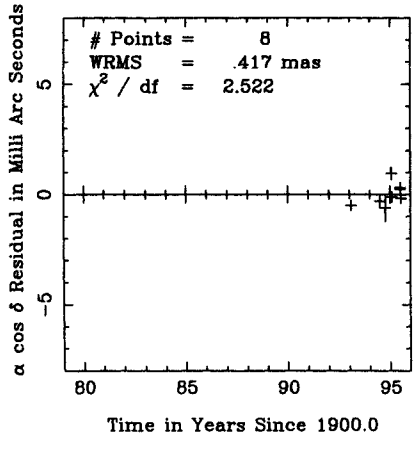
Arc Solution for 1954+513 : $\alpha \cos \delta$



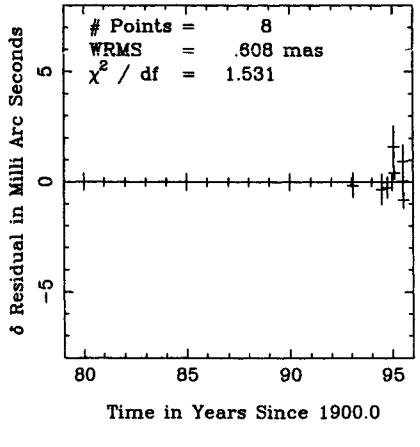
Arc Solution for 1954+513 : δ



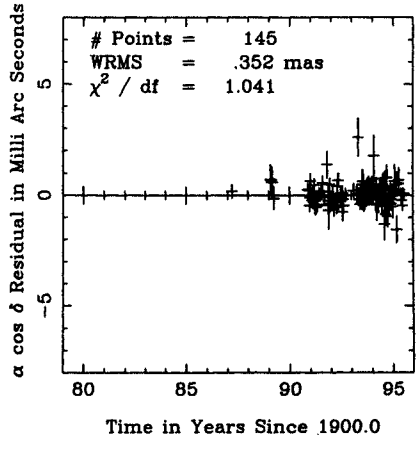
Arc Solution for 1954−388 : $\alpha \cos \delta$



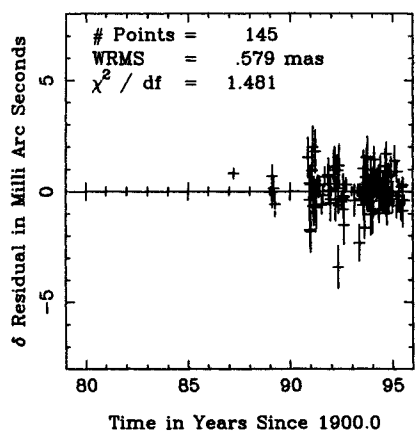
Arc Solution for 1954−388 : δ



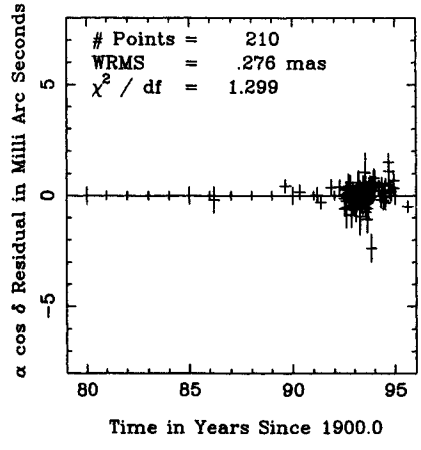
Arc Solution for 1958−179 : $\alpha \cos \delta$



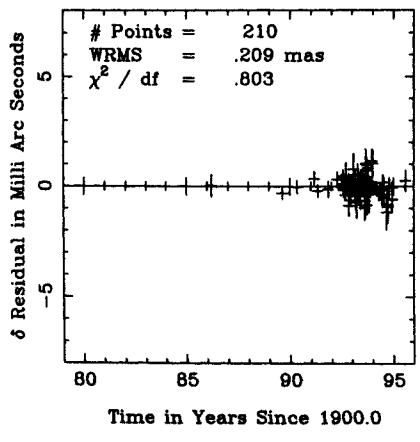
Arc Solution for 1958−179 : δ



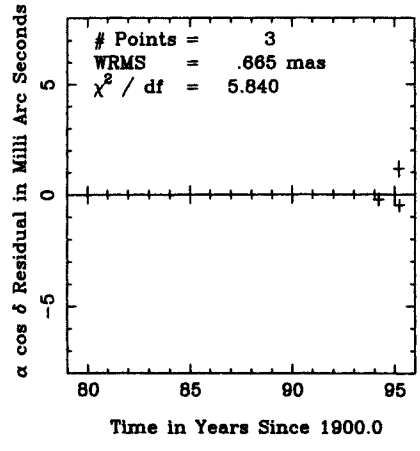
Arc Solution for 2007+777 : $\alpha \cos \delta$



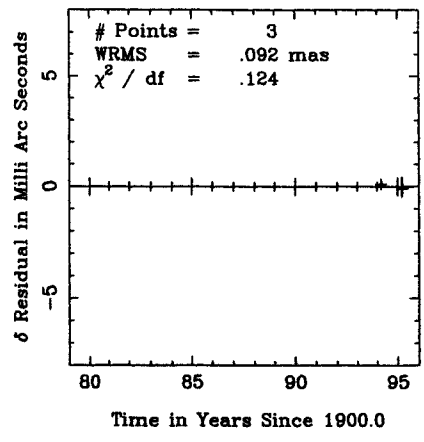
Arc Solution for 2007+777 : δ



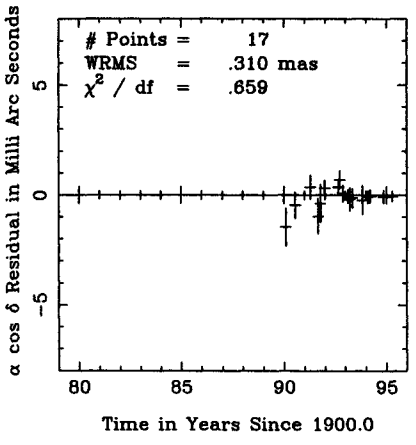
Arc Solution for 2005+642 : $\alpha \cos \delta$



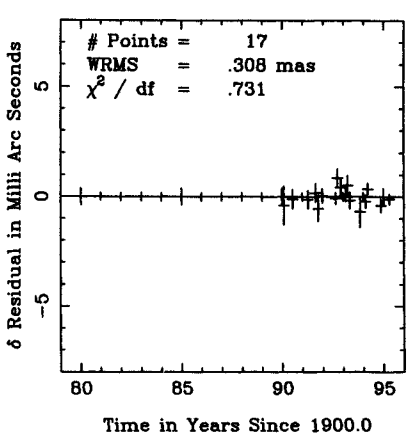
Arc Solution for 2005+642 : δ



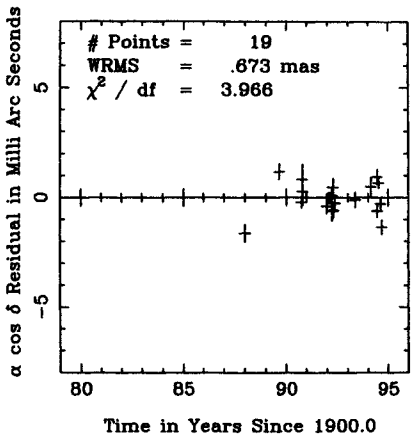
Arc Solution for 2017+745 : α cos δ



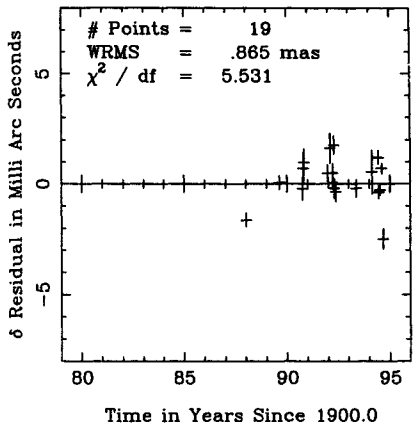
Arc Solution for 2017+745 : δ



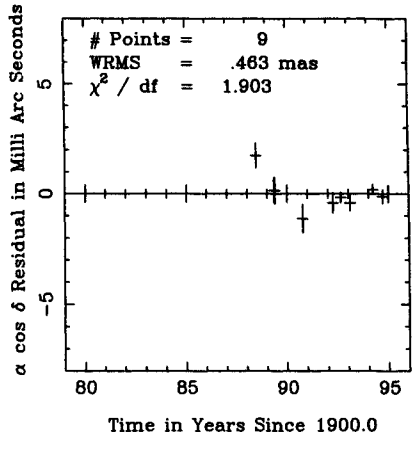
Arc Solution for 2021+614 : α cos δ



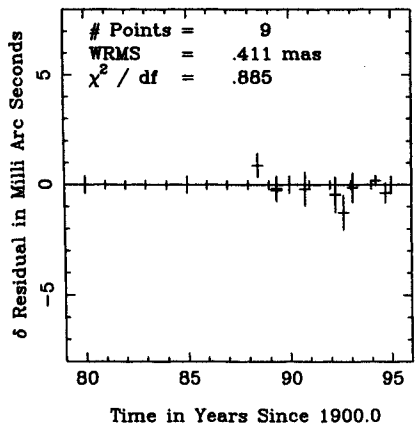
Arc Solution for 2021+614 : δ



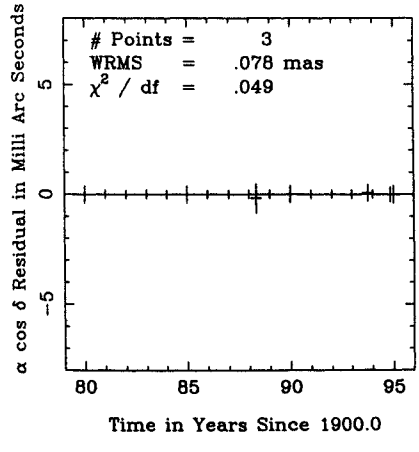
Arc Solution for 2021+317 : α cos δ



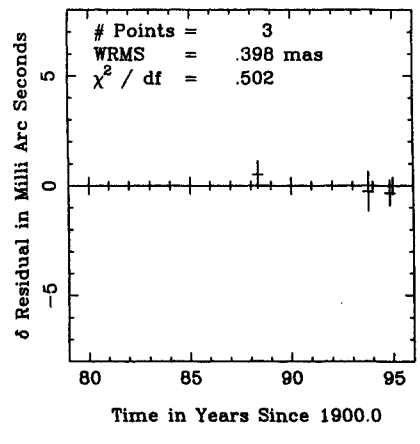
Arc Solution for 2021+317 : δ



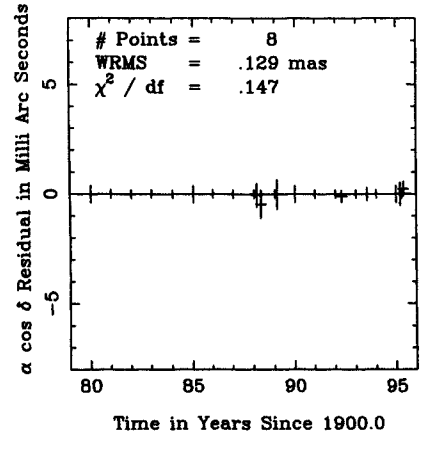
Arc Solution for 2030+547 : α cos δ



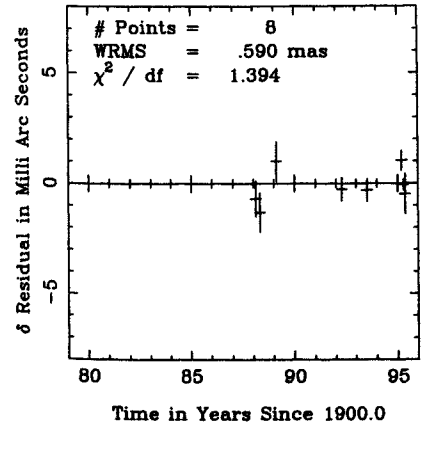
Arc Solution for 2030+547 : δ



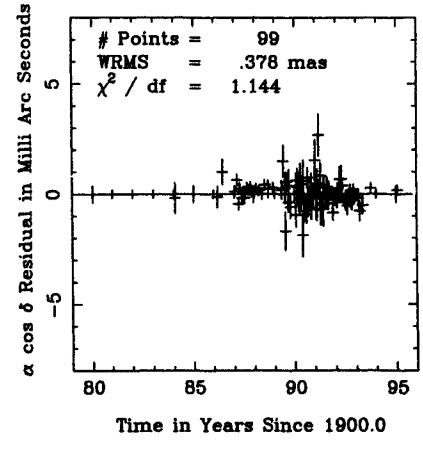
Arc Solution for 2029+121 : α cos δ



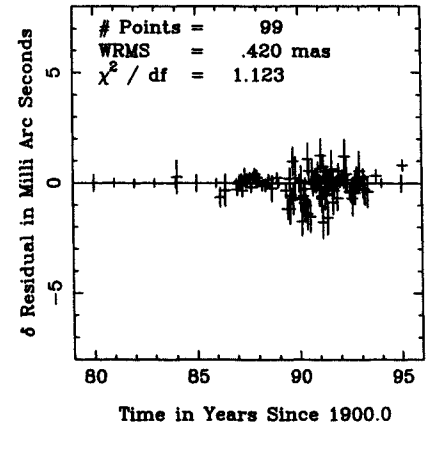
Arc Solution for 2029+121 : δ



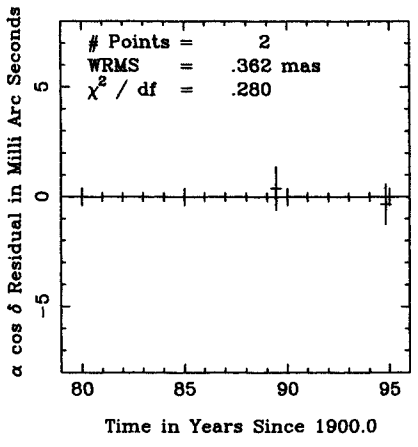
Arc Solution for 2037+511 : α cos δ



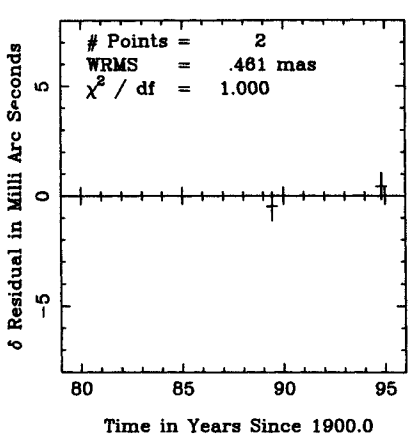
Arc Solution for 2037+511 : δ



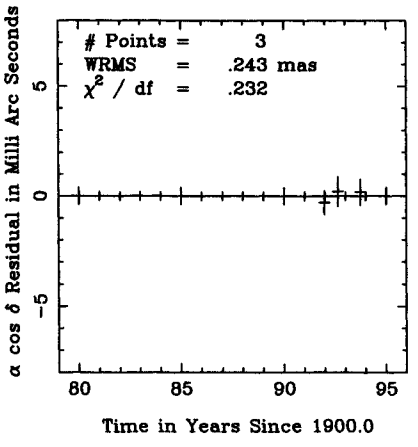
Arc Solution for 2037−253 : α cos δ



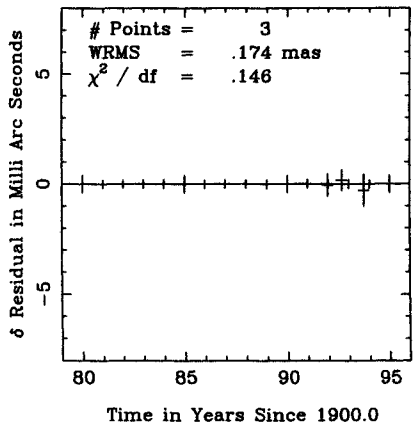
Arc Solution for 2037−253 : δ



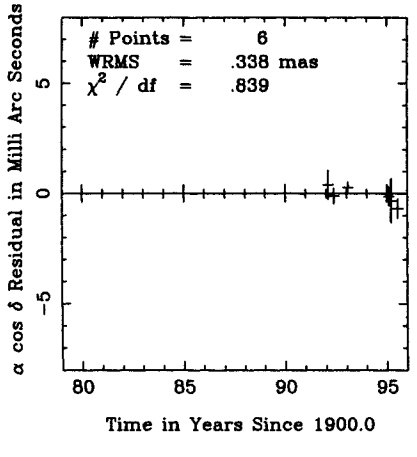
Arc Solution for 2051+745 : α cos δ



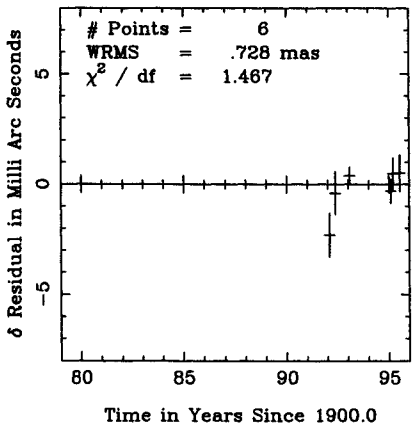
Arc Solution for 2051+745 : δ



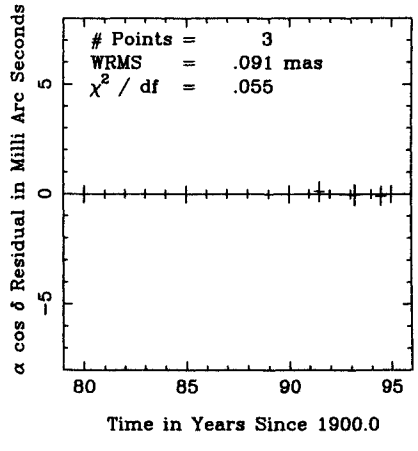
Arc Solution for 2052−474 : α cos δ



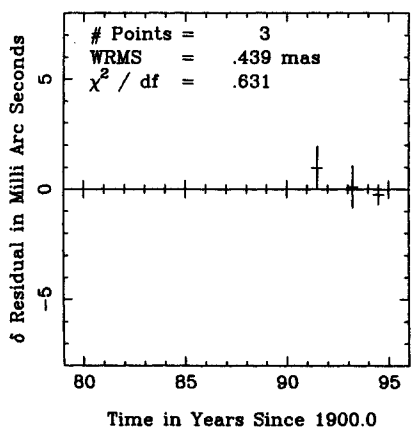
Arc Solution for 2052−474 : δ



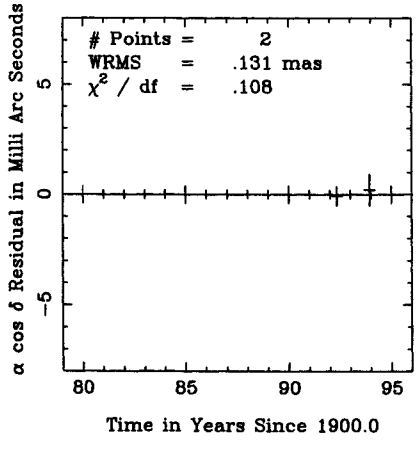
Arc Solution for 2059+034 : α cos δ



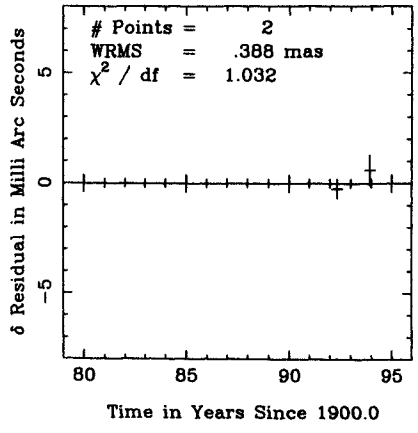
Arc Solution for 2059+034 : δ



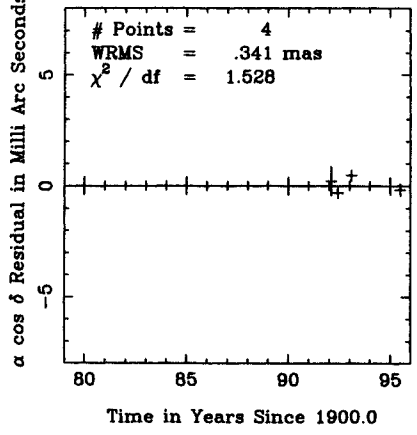
Arc Solution for 2059−786 : α cos δ



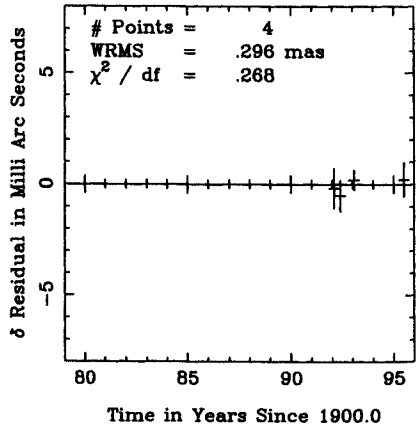
Arc Solution for 2059−786 : δ



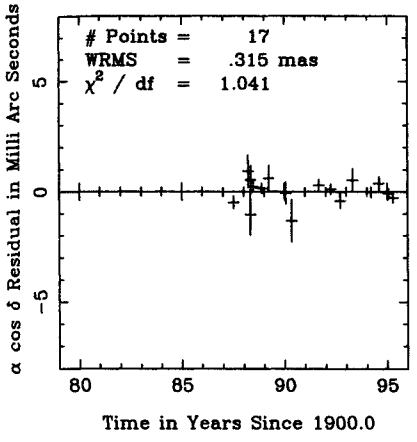
Arc Solution for 2106−413 : α cos δ



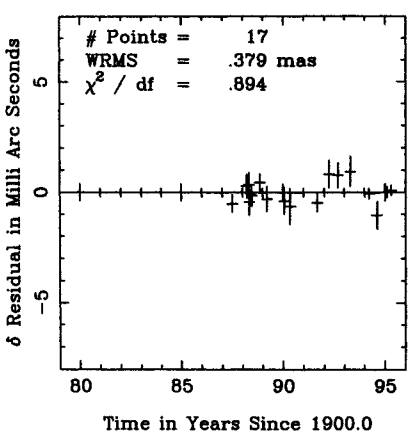
Arc Solution for 2106−413 : δ



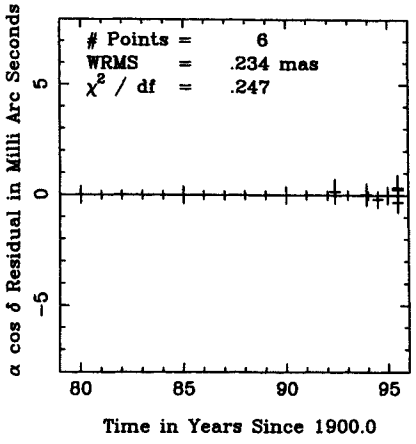
Arc Solution for 2113+293 : α cos δ



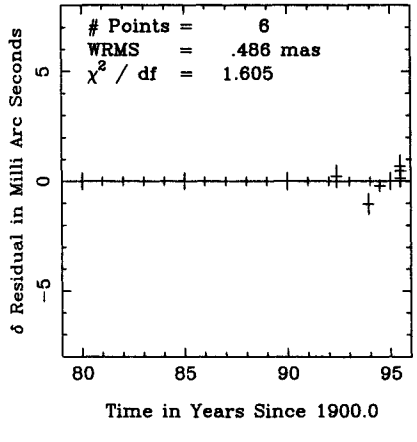
Arc Solution for 2113+293 : δ



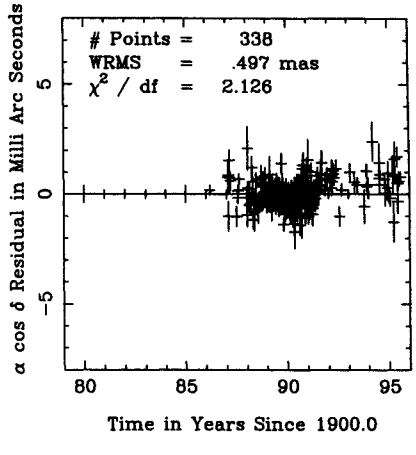
Arc Solution for 2109−811 : α cos δ



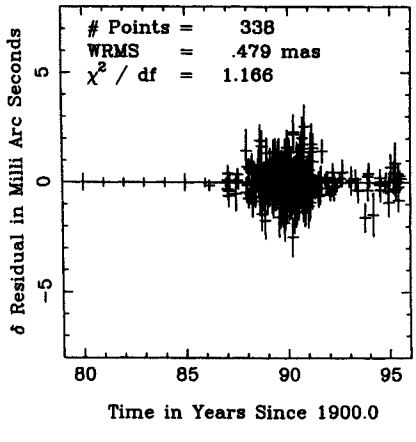
Arc Solution for 2109−811 : δ



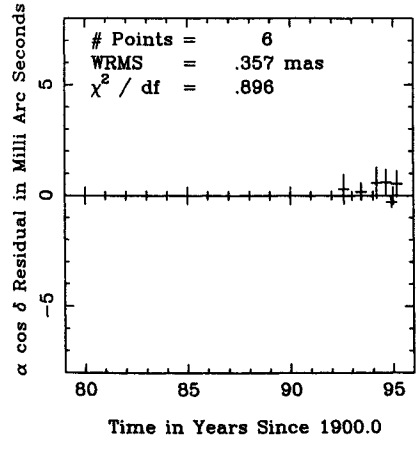
Arc Solution for 2121+053 : α cos δ



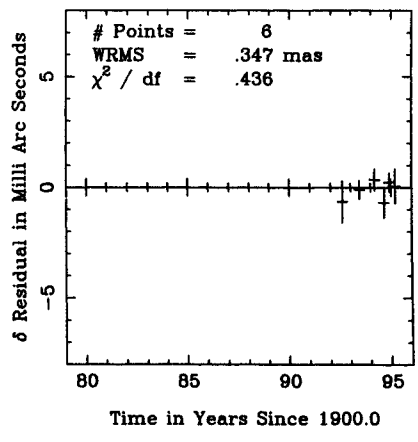
Arc Solution for 2121+053 : δ



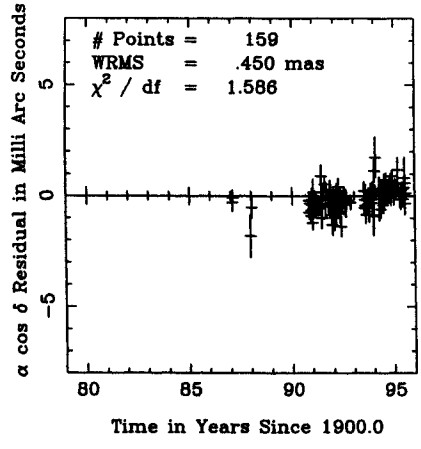
Arc Solution for 2126−158 : α cos δ



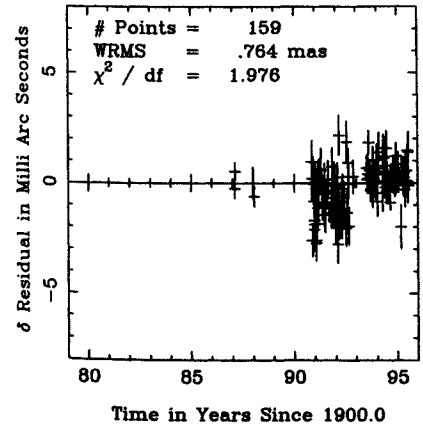
Arc Solution for 2126−158 : δ



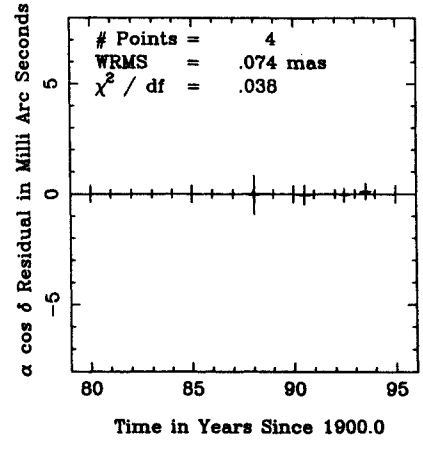
Arc Solution for 2128−123 : α cos δ



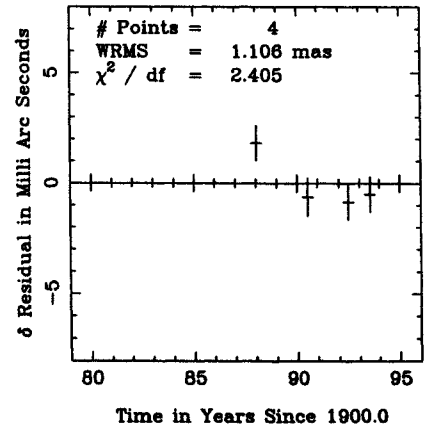
Arc Solution for 2128−123 : δ



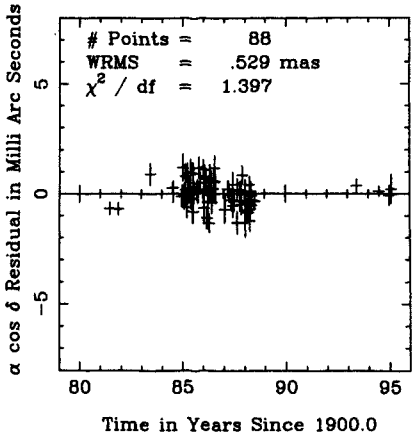
Arc Solution for 2131−021 : α cos δ



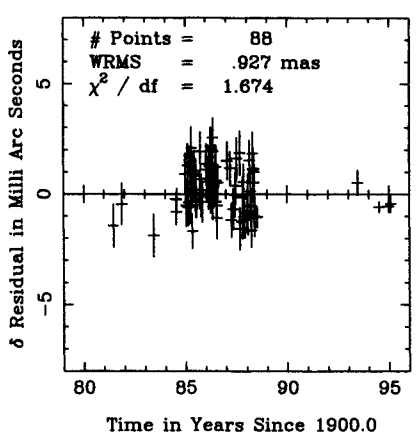
Arc Solution for 2131−021 : δ



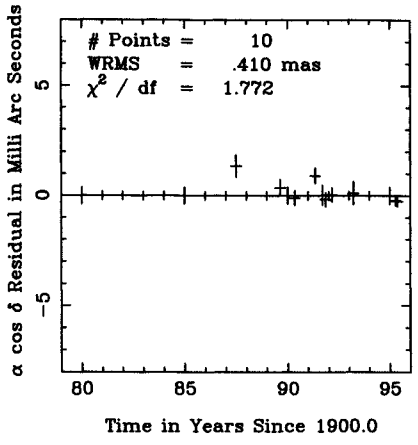
Arc Solution for 2134+004 : α cos δ



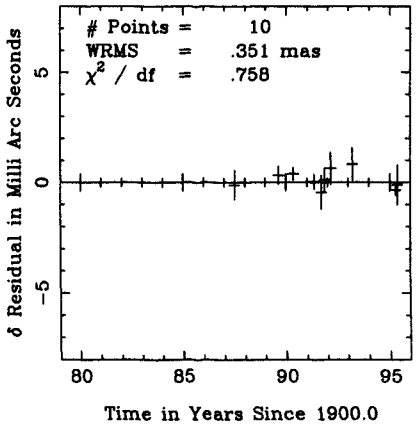
Arc Solution for 2134+004 : δ



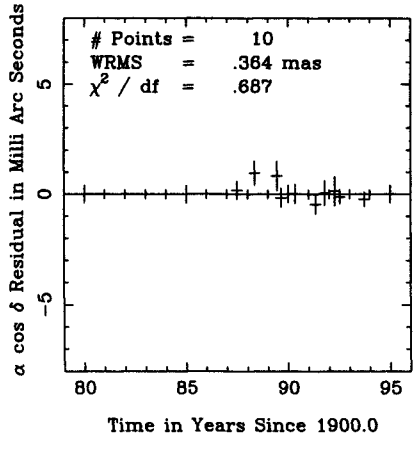
Arc Solution for 2136+141 : α cos δ



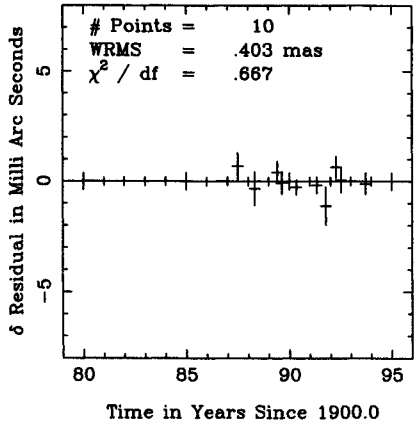
Arc Solution for 2136+141 : δ



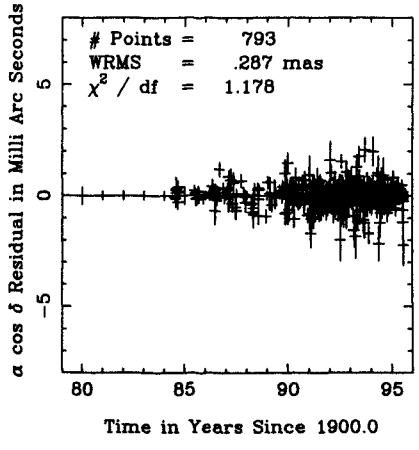
Arc Solution for 2144+092 : α cos δ



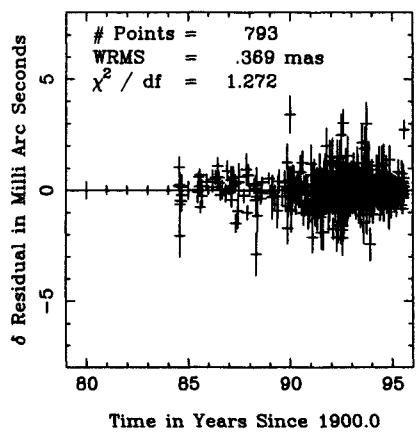
Arc Solution for 2144+092 : δ



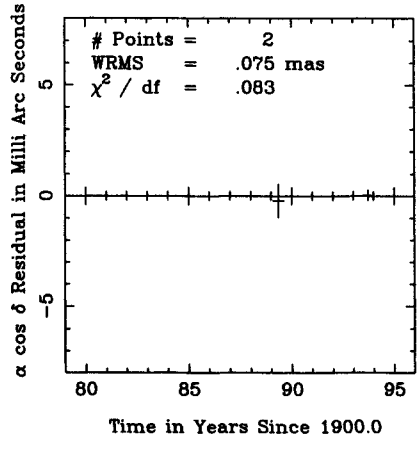
Arc Solution for 2145+067 : α cos δ



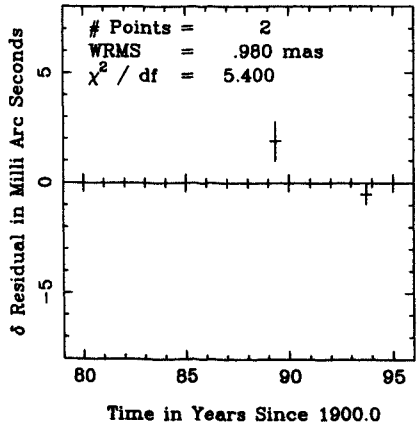
Arc Solution for 2145+067 : δ



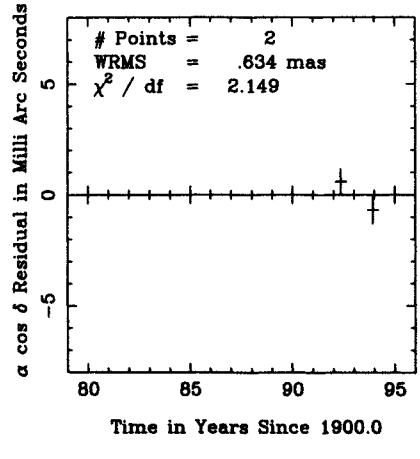
Arc Solution for 2149+056 : α cos δ



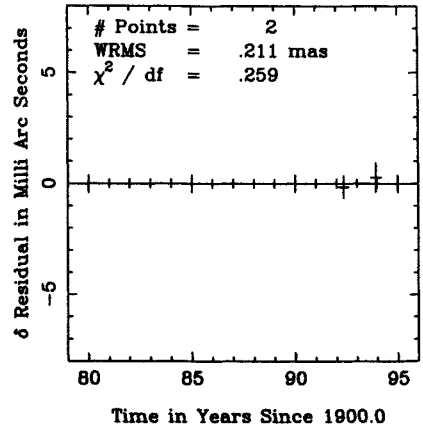
Arc Solution for 2149+056 : δ



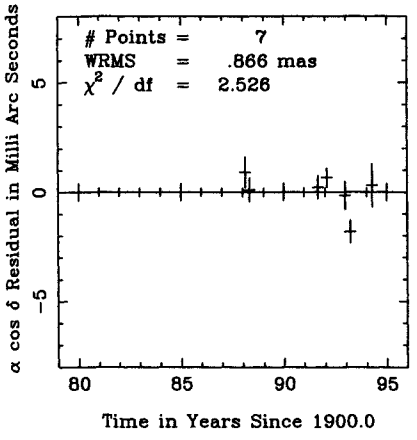
Arc Solution for 2146−783 : α cos δ



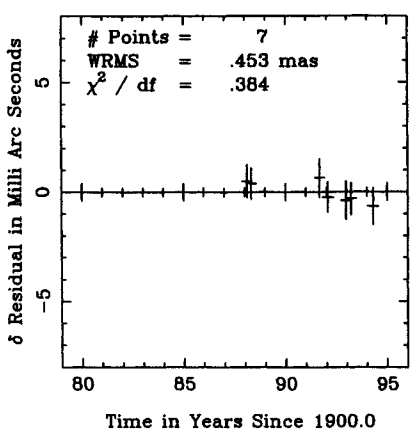
Arc Solution for 2146−783 : δ



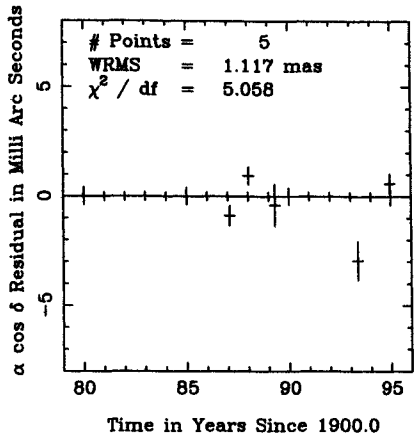
Arc Solution for 2150+173 : α cos δ



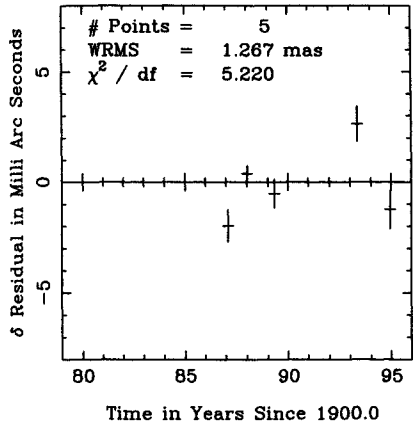
Arc Solution for 2150+173 : δ



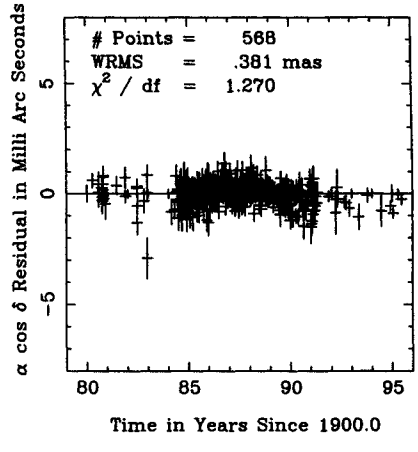
Arc Solution for 2155−152 : α cos δ



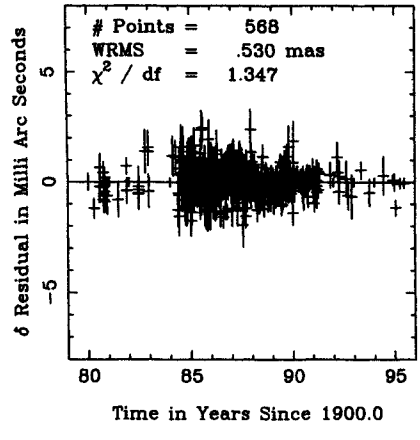
Arc Solution for 2155−152 : δ



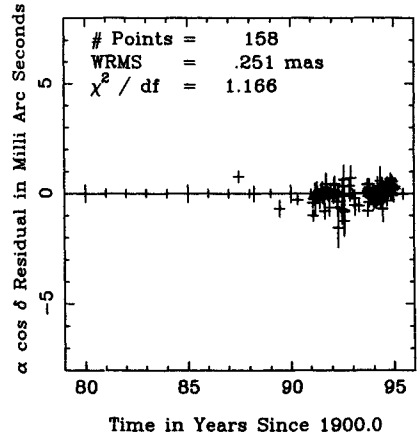
Arc Solution for 2200+420 : α cos δ



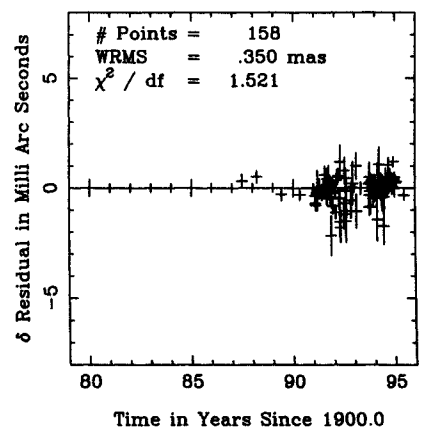
Arc Solution for 2200+420 : δ



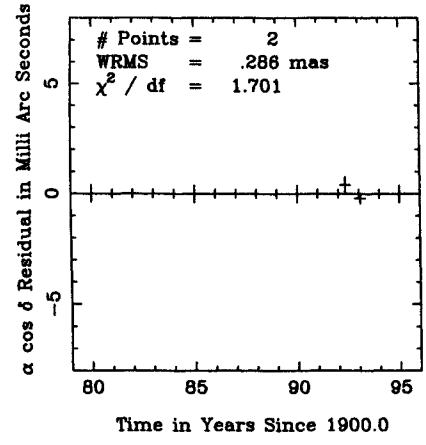
Arc Solution for 2201+315 : α cos δ



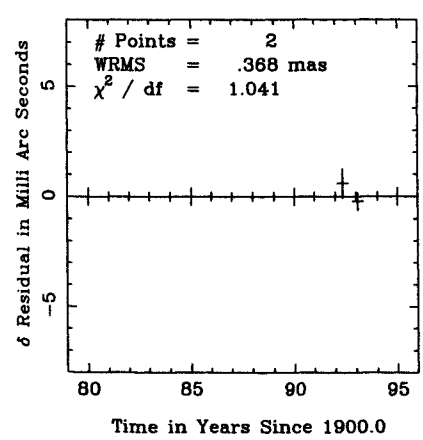
Arc Solution for 2201+315 : δ



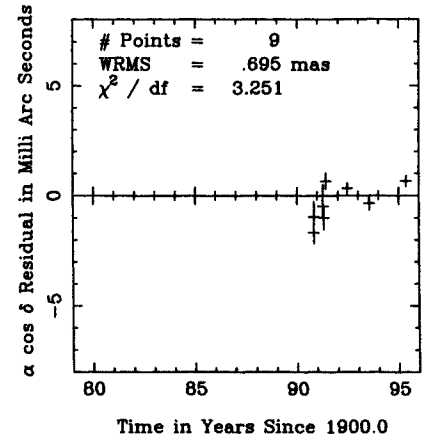
Arc Solution for 2204−540 : α cos δ



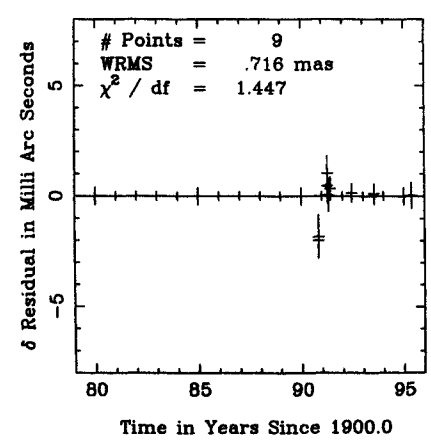
Arc Solution for 2204−540 : δ



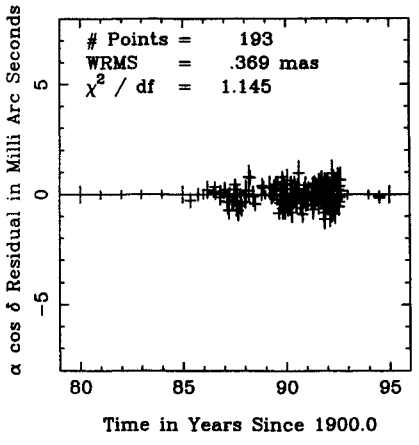
Arc Solution for 2209+236 : α cos δ



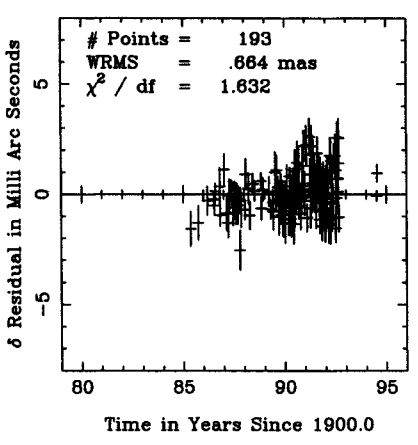
Arc Solution for 2209+236 : δ



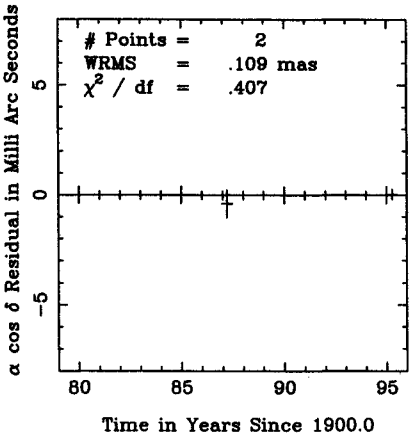
Arc Solution for 2216−038 : α cos δ



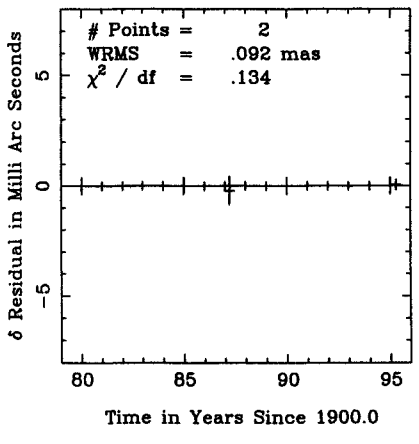
Arc Solution for 2216−038 : δ



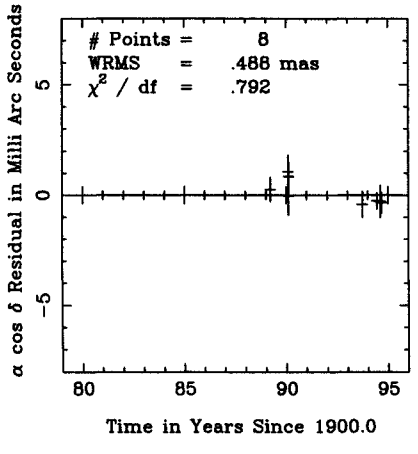
Arc Solution for 2227−088 : α cos δ



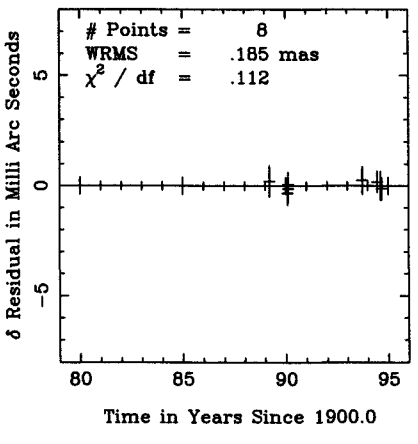
Arc Solution for 2227−088 : δ



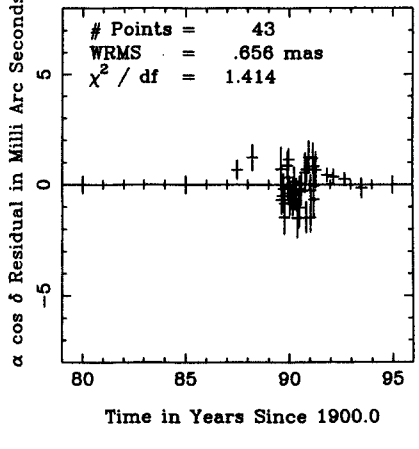
Arc Solution for 2229+695 : α cos δ



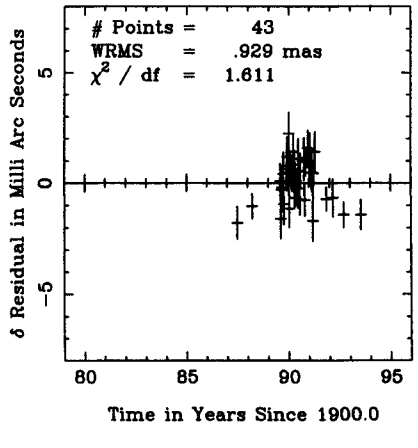
Arc Solution for 2229+695 : δ



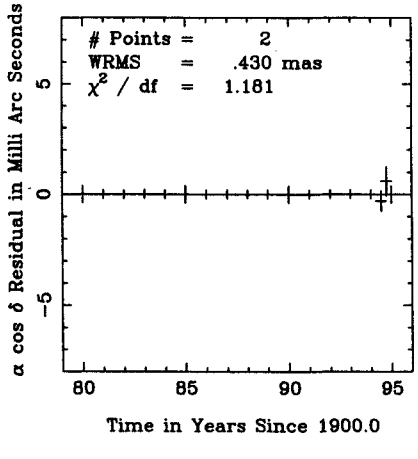
Arc Solution for 2230+114 : α cos δ



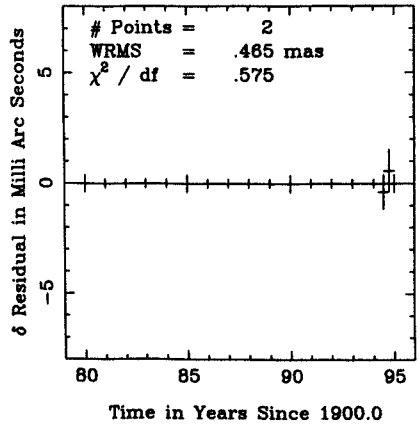
Arc Solution for 2230+114 : δ



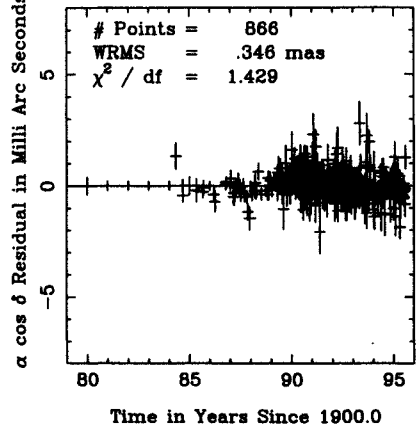
Arc Solution for 2232−488 : α cos δ



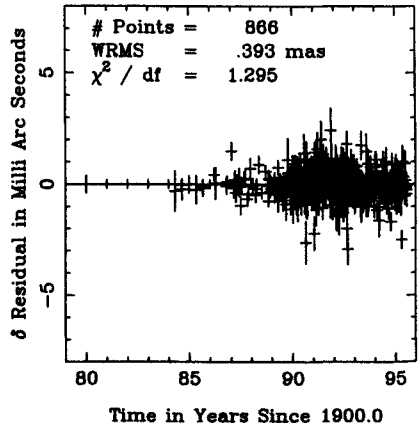
Arc Solution for 2232−488 : δ



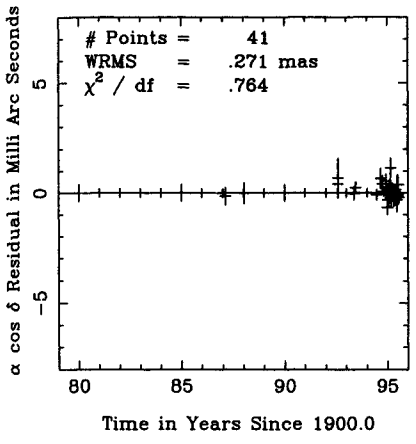
Arc Solution for 2234+282 : α cos δ



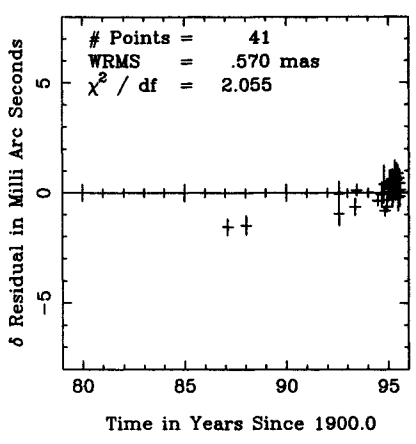
Arc Solution for 2234+282 : δ



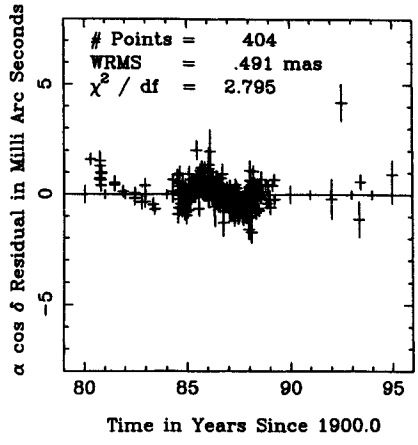
Arc Solution for 2243−123 : α cos δ



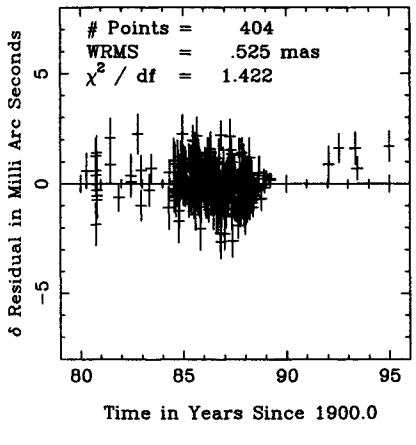
Arc Solution for 2243−123 : δ



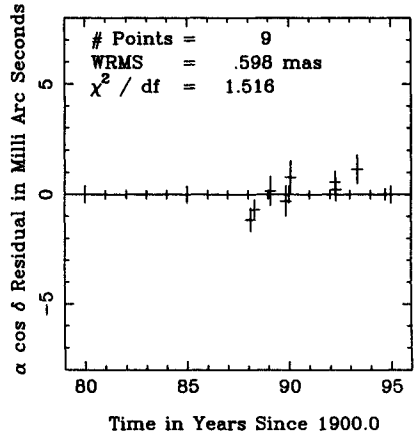
Arc Solution for 2251+158 : α cos δ



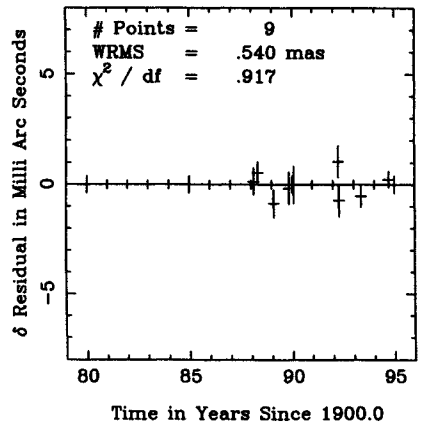
Arc Solution for 2251+158 : δ



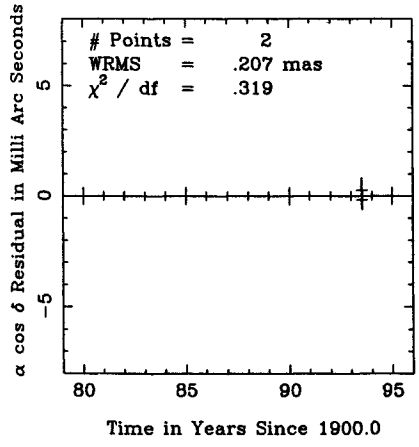
Arc Solution for 2253+417 : α cos δ



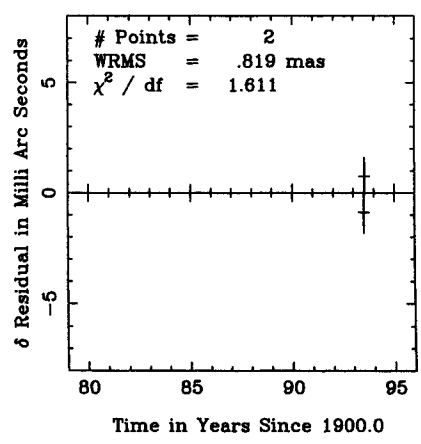
Arc Solution for 2253+417 : δ



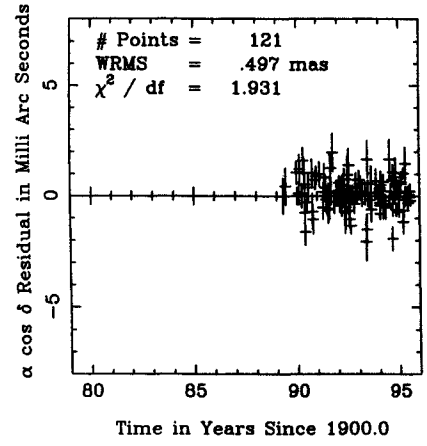
Arc Solution for 2254+024 : α cos δ



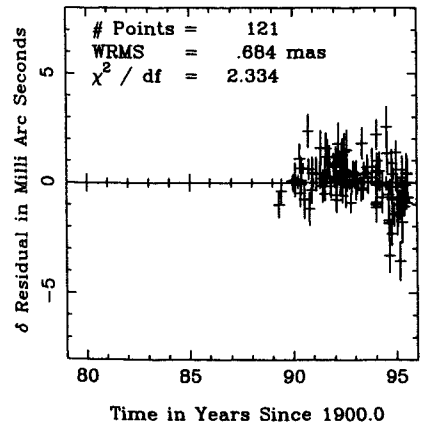
Arc Solution for 2254+024 : δ



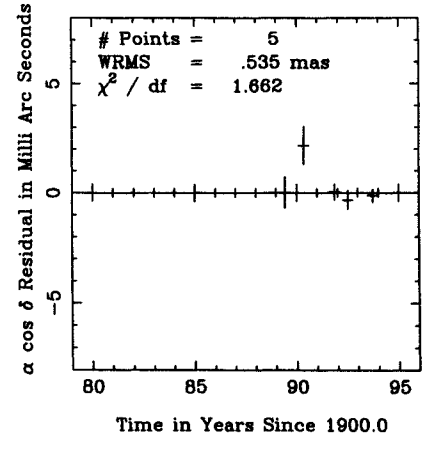
Arc Solution for 2255−282 : α cos δ



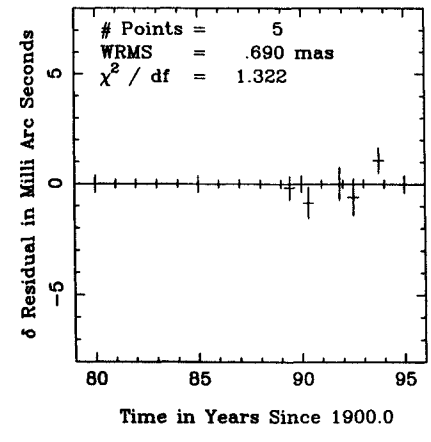
Arc Solution for 2255−282 : δ



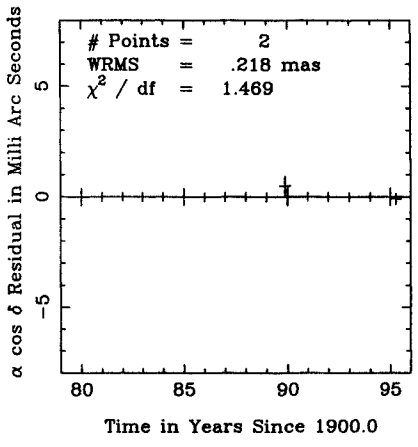
Arc Solution for 2318+049 : α cos δ



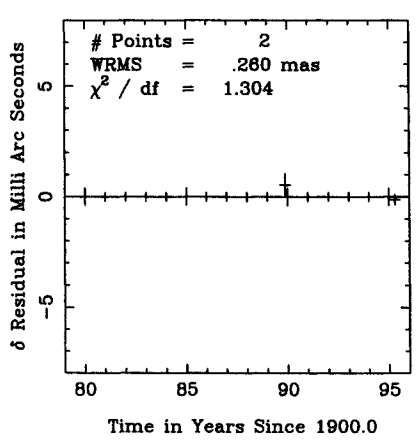
Arc Solution for 2318+049 : δ



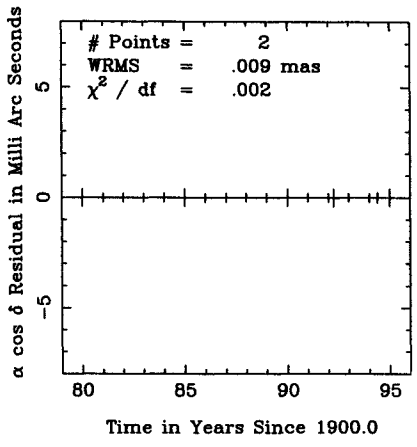
Arc Solution for 2319+272 : $\alpha \cos \delta$



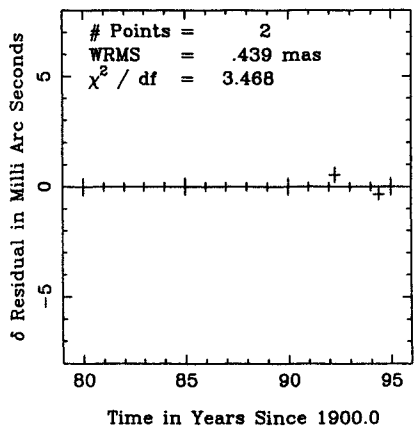
Arc Solution for 2319+272 : δ



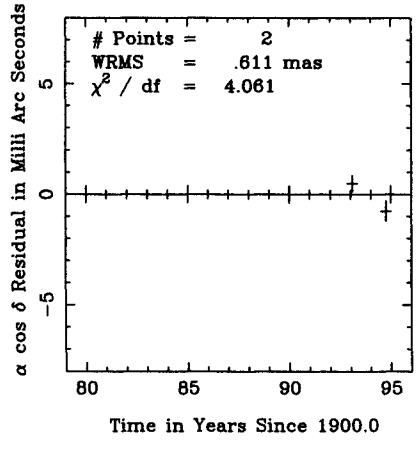
Arc Solution for 2320+506 : $\alpha \cos \delta$



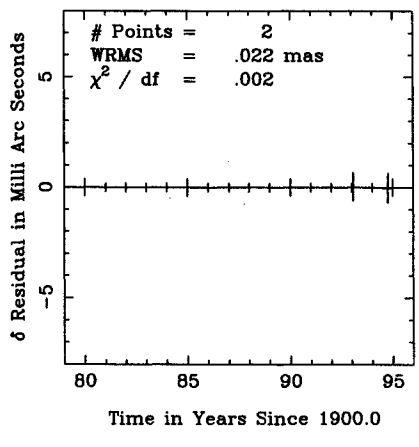
Arc Solution for 2320+506 : δ



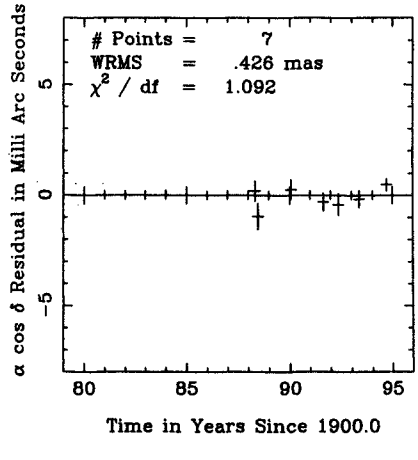
Arc Solution for 2326−477 : $\alpha \cos \delta$



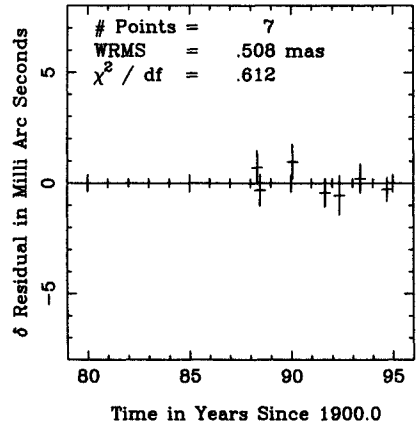
Arc Solution for 2326−477 : δ



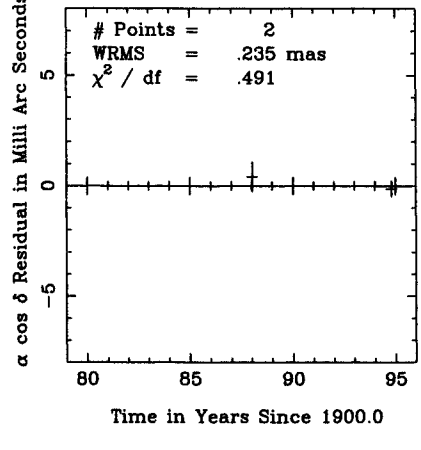
Arc Solution for 2328+107 : $\alpha \cos \delta$



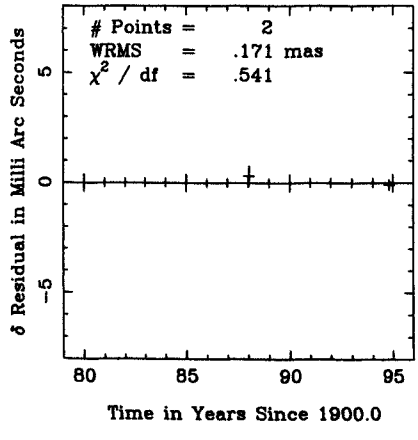
Arc Solution for 2328+107 : δ



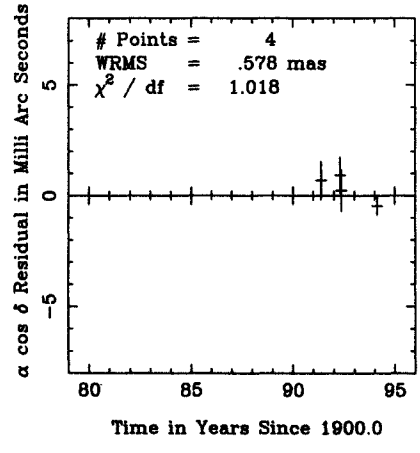
Arc Solution for 2329−162 : $\alpha \cos \delta$



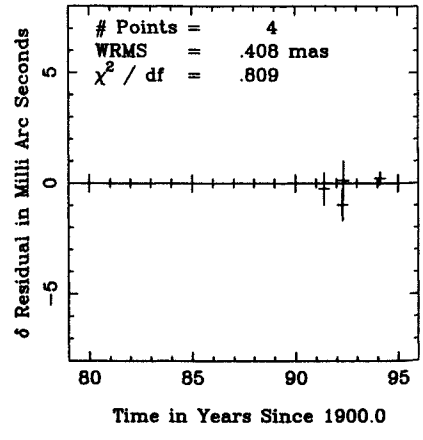
Arc Solution for 2329−162 : δ



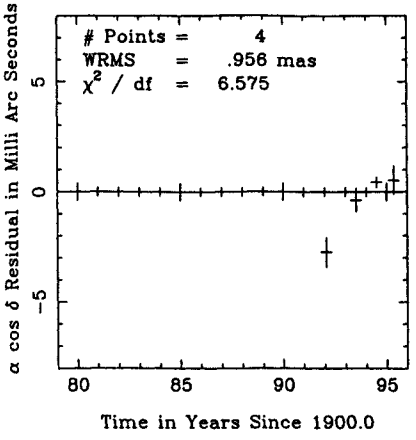
Arc Solution for 2331−240 : $\alpha \cos \delta$



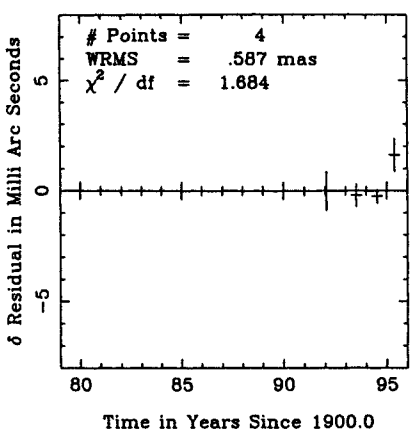
Arc Solution for 2331−240 : δ



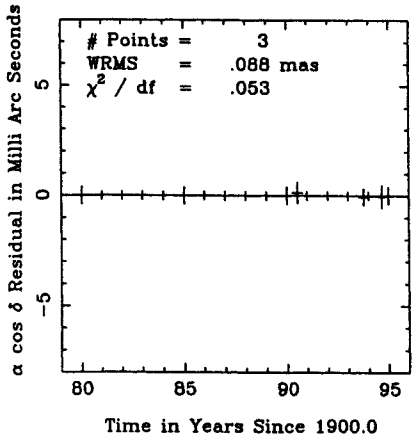
Arc Solution for 2337+264 : $\alpha \cos \delta$



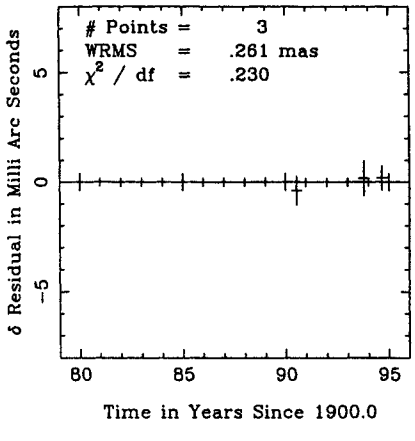
Arc Solution for 2337+264 : δ



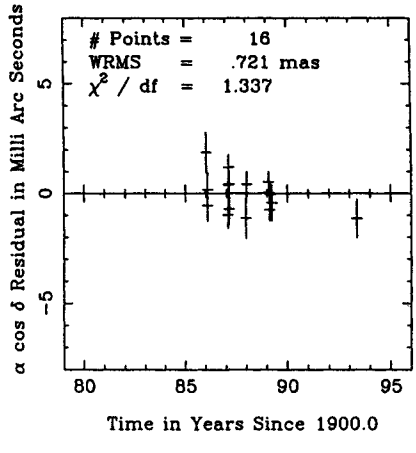
Arc Solution for 2344+092 : $\alpha \cos \delta$



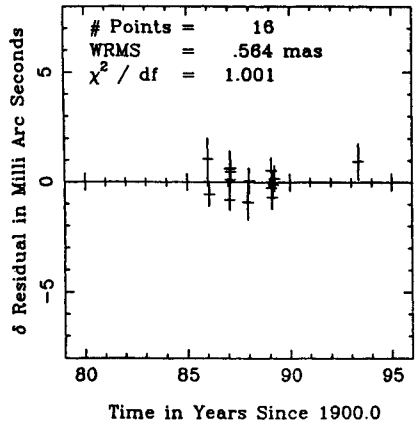
Arc Solution for 2344+092 : δ



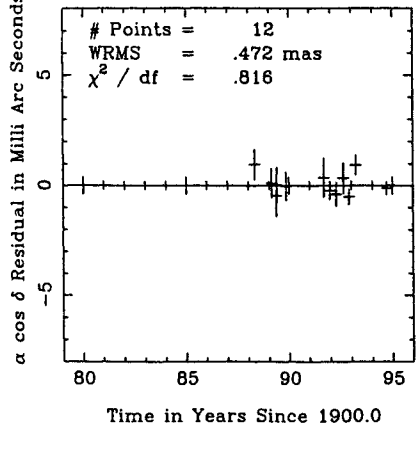
Arc Solution for 2345−167 : $\alpha \cos \delta$



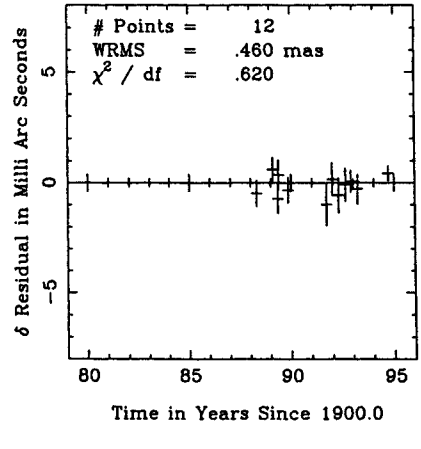
Arc Solution for 2345−167 : δ



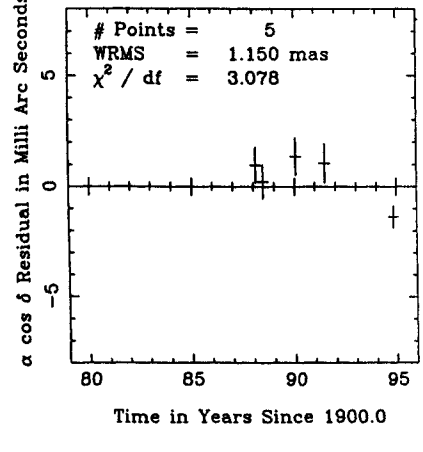
Arc Solution for 2351+456 : $\alpha \cos \delta$



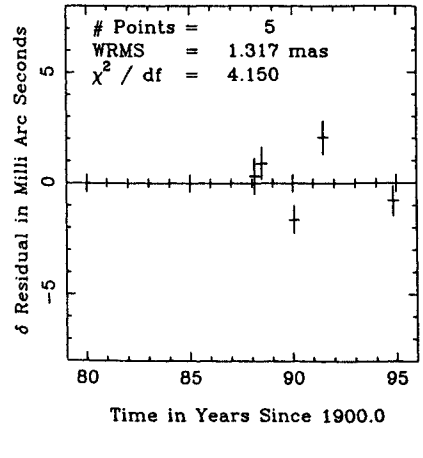
Arc Solution for 2351+456 : δ



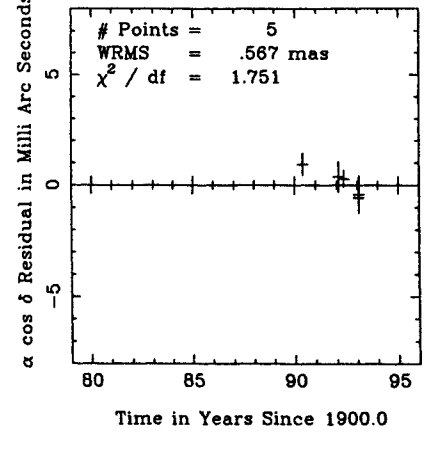
Arc Solution for 2352+495 : $\alpha \cos \delta$



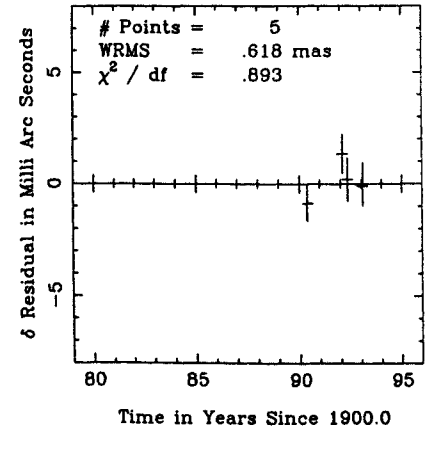
Arc Solution for 2352+495 : δ

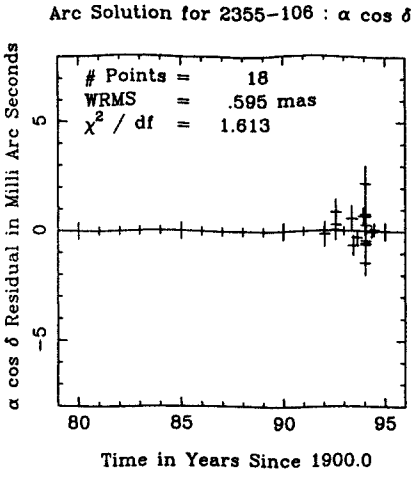


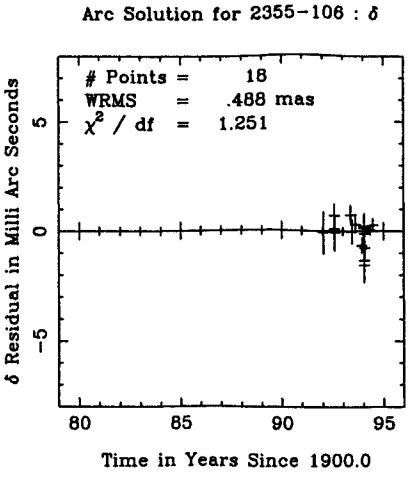
Arc Solution for 2355−534 : $\alpha \cos \delta$



Arc Solution for 2355−534 : δ




Arc Solution for 2355-106 : α cos δ
# Points = 18
WRMS = .595 mas
χ² / df = 1.613
α cos δ Residual in Milli Arc Seconds
5
0
-5
80
85
90
95
Time in Years Since 1900.0


Arc Solution for 2355-106 : δ
# Points = 18
WRMS = .488 mas
χ² / df = 1.251
δ Residual in Milli Arc Seconds
5
0
-5
80
85
90
95
Time in Years Since 1900.0