Appendix

A1. ITRF2008 tie and space geodesy discrepancies

A2. ITRF2008 Article

Altamimi Z, Collilieux X, Métivier L (2011) ITRF2008: an improved solution of the international terrestrial reference frame, Journal of Geodesy, 85 (8) (457-473), DOI: 10.1007/s00190-011-0444-4, DOI: 10.1007/s00190-011-0444-4.

A3. Description of Technique Center solutions

- IVS solution description (auth. S. Bckmann, A. Nothnagel)
- ILRS solution description (auth. E. Pavlis, V. Luceri, C. Sciarretta, R. Kelm)
- IGS solution description (auth. R. Ferland)
- IDS solution description (auth. J.J. Valette, F. Lemoine)

ITRF2008 tie and space geodesy discrepancies

ITRF2008 tie discrepancies at tie epochs in (E)ast, (N)orth, (U)p and (D)istance : Residuals = Space Geodesy - Terrestrial Tie (in mm). Each tie vector component is flagged by '-' if the residual is less than 5 mm and by '*' otherwise. (Sol)ution number that identifies the reference coordinates.

Code	DOMES #	Sol	Code	DOMES #	Sol	E	N	U	D	Epoch	ENU	Tech	D
YELL	40127M003	3	7285	40127M001	1	-3.9	-3.9	-1.0	-2.2	1:285	---	VLBI	
WTZZ	14201M014	1	7224	14201S004	1	-1.4	-4.1	-0.3	-1.6	2:266	---	VLBI	
SYOG	66006S002	1	7342	66006S004	1	0.8	3.8	0.6	2.8	0: 1	---	VLBI	
HOB2	50116M004	1	7242	50116S002	1	4.7	-3.0	-2.0	1.4	2: 81	---	VLBI	
TSKB	21730S005	3	7345	21730S007	1	-2.9	-0.8	-3.0	-0.5	8: 16	---	VLBI	
CRO1	43201M001	2	7615	43201S001	1	-1.5	2.2	1.6	-1.9	94: 16	---	VLBI	
HRAO	30302M004	1	7232	30302S001	1	-1.6	3.2	2.0	2.3	3:214	---	VLBI	
STJO	40101M001	5	7625	40101M003	1	0.3	0.1	1.6	-0.3	99:269	---	VLBI	
FORT	41602M001	1	7297	41602S001	1	-0.6	-4.0	2.3	3.9	93:264	---	VLBI	
MKEA	40477M001	1	7617	40477S001	1	-3.7	-1.1	0.8	-3.7	96:221	---	VLBI	
DRAO	40105M002	2	7283	40105M001	1	-0.7	-0.7	-0.5	-0.7	89:234	---	VLBI	
PIE1	40456M001	1	7234	40456S001	1	-3.1	-2.8	-0.3	3.7	92:336	---	VLBI	
NYA1	10317M003	2	7331	10317S003	1	2.9	-2.7	1.2	3.9	3:228	---	VLBI	
TIDB	50103M108	2	1545	50103S010	1	-0.5	0.6	9.2	1.1	95:263	--*	VLBI	
WES2	40440S020	2	7209	40440S003	1	0.6	-3.7	10.2	2.6	96:278	--*	VLBI	
MEDI	12711M003	2	7230	12711S001	2	-2.4	-2.7	6.3	-1.2	7:241	--*	VLBI	
YEBE	13420M001	1	7333	13420S001	1	-3.6	-1.1	-6.0	2.7	99:322	--*	VLBI	
NLIB	40465M001	1	7612	40465S001	1	-3.4	-2.0	-5.2	-3.8	93: 64	--*	VLBI	
VNDP	40420M007	6	7223	40420M002	1	2.3	-1.3	-7.0	1.7	91:335	--*	VLBI	
CONZ	41719M002	1	7640	41719S001	1	1.4	-4.2	7.8	-4.3	3: 80	--*	VLBI	
ALGO	40104M002	5	7282	40104S001	1	-2.9	-4.0	9.0	5.7	99: 1	--*	VLBI	*
OHI2	66008M005	1	7245	66008S001	1	-0.8	8.4	3.4	-1.4	2: 43	-*-	VLBI	
SHAO	21605M002	2	7227	21605S009	1	-2.1	-10.1	-4.9	7.1	3:332	-*-	VLBI	*
FAIR	40408M001	2	7225	40408S002	1	-2.3	-8.2	2.1	-5.7	1:274	-*-	VLBI	*
MDO1	40442M012	1	7613	40442S017	1	-0.2	-7.6	16.5	3.6	93: 76	-**	VLBI	
WTZZ	14201M014	1	7593	14201S100	1	-1.7	-5.6	7.8	-0.7	2:266	-**	VLBI	
KSMV	21701S007	1	1856	21701S001	1	-1.3	11.0	99.2	0.1	99:292	-**	VLBI	
YELL	40127M003	3	7296	40127M004	1	-3.1	-6.6	-8.3	0.4	1:285	-**	VLBI	
MDO1	40442M012	1	7216	40442S003	1	2.0	-9.8	7.3	7.1	93: 76	-**	VLBI	*
WES2	40440S020	2	7205	40440S002	1	9.0	-0.7	-2.8	2.5	96:278	*--	VLBI	
MADR	13407S012	8	1565	13407S010	1	-9.1	-1.0	1.0	6.0	99: 1	*--	VLBI	*
SANT	41705M003	2	1404	41705S006	1	16.1	4.9	9.4	-1.6	92:192	*-*	VLBI	
ZECK	12351M001	2	7381	12351S001	1	-25.5	-3.5	13.9	2.2	5: 1	*-*	VLBI	
ONSA	10402M004	2	7213	10402S002	1	5.4	-0.6	-5.2	2.1	2:193	*-*	VLBI	
NOT1	12717M004	1	7547	12717S001	1	-9.1	-3.4	7.2	8.9	5:264	*-*	VLBI	*
MATE	12734M008	4	7243	12734S005	1	-6.9	-6.8	-2.0	-0.9	4:300	**-	VLBI	
KOKB	40424M004	4	1311	40424S001	1	17.4	38.2	1.8	-10.4	2:319	**-	VLBI	*
KOKB	40424M004	4	7298	40424S007	1	18.1	36.6	3.3	26.6	2:319	**-	VLBI	*
SVTL	12350M001	2	7380	12350S001	1	-5.6	-10.7	-10.2	2.3	5: 1	***	VLBI	
BRFT	41602M002	1	7297	41602S001	1	-5.7	-5.1	12.1	7.8	6: 78	***	VLBI	*
ZIMM	14001M004	1	7810	14001S001	1	0.5	-1.3	0.9	-1.6	96: 95	---	SLR	
GRAS	10002M006	1	7845	10002S002	1	-1.1	-1.2	-0.6	-0.9	99:284	---	SLR	
STR1	50119M002	3	7849	50119S001	1	4.1	0.1	4.0	-0.8	1:209	---	SLR	
HERS	13212M007	5	7840	13212S001	1	-1.2	-3.1	-2.4	-0.6	8:177	---	SLR	
MATE	12734M008	4	7941	12734S008	1	-3.7	-4.7	-1.6	3.6	4:300	---	SLR	
BOR1	12205M002	1	7811	12205S001	2	0.5	1.7	-2.9	0.6	94: 10	---	SLR	
MAUI	40445S008	1	7120	40445M002	1	0.6	-1.0	-3.9	-0.5	6:260	---	SLR	
HRAO	30302M004	1	7501	30302M003	1	-2.2	2.6	3.5	2.9	3:214	---	SLR	
GODE	40451M123	2	7105	40451M105	1	-3.2	1.2	-6.1	0.4	8: 1	--*	SLR	
CAGL	12725M003	1	7545	12725M002	1	2.1	3.0	6.7	-3.0	95:161	--*	SLR	
MAUI	40445S008	1	7210	40445M001	3	2.8	-0.7	-8.7	1.8	6:260	--*	SLR	
MAUI	40445S008	1	7119	40445M004	1	0.0	-1.4	-6.7	2.9	6:260	--*	SLR	
MDO1	40442M012	1	7850	40442M008	1	2.1	0.8	21.5	-2.8	93: 76	--*	SLR	
AREQ	42202M005	5	7403	42202M003	6	1.3	-0.3	-6.6	-0.6	7:123	--*	SLR	
GRAZ	11001M002	1	7839	11001S002	1	1.4	-0.6	-5.9	-2.2	92:319	--*	SLR	
ALGO	40104M002	5	7410	40104M003	1	1.6	-4.5	7.1	2.3	99: 1	--*	SLR	

YAR1	50107M004	3	7090	50107M001	1	3.3	-1.9	14.4	-3.7	3:305	--*	SLR	
MONP	40497M004	2	7110	40497M001	1	3.2	-2.5	5.7	-1.6	99:280	--*	SLR	
THTI	92201M009	2	7124	92201M007	1	3.0	0.8	9.9	1.6	7:278	--*	SLR	
ZIMM	14001M004	1	7810	14001S007	1	-1.9	-2.2	-5.2	0.1	96: 95	--*	SLR	
POTS	14106M003	1	7836	14106S009	1	2.7	-0.2	6.8	-2.7	94:221	--*	SLR	
GRAS	10002M006	1	7835	10002S001	1	1.3	-3.6	-5.6	1.3	99:284	--*	SLR	
WTZZ	14201M014	1	8834	14201S018	2	-1.4	-4.2	7.6	-0.2	2:266	--*	SLR	
BJFS	21601M001	1	7249	21601S004	1	0.6	2.2	5.9	-2.5	3:171	--*	SLR	
METS	10503S011	1	7806	10503S014	1	-2.3	-3.2	-10.8	7.3	0:299	--*	SLR	*
CONZ	41719M002	1	7405	41719M001	1	1.4	-4.6	6.9	-5.2	3: 80	--*	SLR	*
EISL	41703M003	1	7097	41703M002	1	-2.1	-21.1	-3.0	-17.1	1: 46	-*-	SLR	*
AREQ	42202M005	1	7403	42202M003	1	3.9	-6.9	9.8	3.0	95: 1	-**	SLR	
MDO1	40442M012	1	7080	40442M006	2	4.4	-8.3	17.5	4.0	93: 76	-**	SLR	
KGNI	21704S005	1	7308	21704S002	1	-1.9	-6.0	34.8	-0.4	99:285	-**	SLR	
SHAO	21605M002	2	7837	21605S001	2	4.5	-5.0	-20.3	-3.1	3:332	-**	SLR	
KSMV	21701S007	1	1857	21701S004	1	-2.2	18.5	72.5	9.4	99:292	-**	SLR	*
KSMV	21701S007	1	7335	21701M002	1	4.6	8.6	70.3	14.1	99:292	-**	SLR	*
AJAC	10077M005	1	7848	10077M002	1	-6.1	-3.8	14.5	-4.0	0: 1	*-*	SLR	
SUTH	30314M002	1	7502	30314M001	1	12.6	3.6	7.6	-12.5	97:340	*-*	SLR	*
POTS	14106M003	1	7841	14106S011	1	-20.0	-1.4	-8.7	11.3	94:221	*-*	SLR	*
URUM	21612M001	1	7355	21612M002	1	-18.2	-3.3	24.6	-18.4	99: 1	*-*	SLR	*
STR1	50119M002	3	7825	50119S003	1	6.5	-5.4	1.0	3.9	1:209	**-	SLR	
METS	10503S011	1	7805	10503S001	1	23.2	57.8	0.6	-41.7	0:299	**-	SLR	*
WUHN	21602M001	2	7231	21602S004	1	-8.6	-31.8	36.0	-4.0	3:342	***	SLR	
TIDB	50103M108	2	7843	50103S007	1	9.2	10.7	10.8	-11.6	95:263	***	SLR	*
KGNI	21704S005	1	7328	21704M001	1	-5.5	-8.2	67.4	-16.0	99:285	***	SLR	*
SFER	13402M004	6	7824	13402S007	1	7.1	-10.0	-16.5	-9.6	9:192	***	SLR	*
LHAS	21613M001	2	7356	21613M003	1	11.5	13.8	-35.5	-15.5	0: 56	***	SLR	*
QUIN	40433M004	2	7109	40433M002	1	-9.6	5.2	24.7	9.0	85:247	***	SLR	*
REUN	97401M003	1	REUB	97401S002	1	0.4	2.5	-1.0	-2.4	3:335	---	DORIS	
TLSE	10003M009	2	TLSA	10003S001	1	-1.2	0.7	2.3	-0.8	4: 34	---	DORIS	
NYA1	10317M003	2	SPJB	10317S005	1	-1.9	-0.8	-0.9	-1.3	3:228	---	DORIS	
YSSK	12329M003	2	SAKA	12329S001	4	-0.4	-2.3	-2.9	1.3	4:231	---	DORIS	
DIOA	12602S011	1	DIOB	12602S012	1	-0.1	0.8	-0.2	0.8	6:136	---	DORIS	
NKLG	32809M002	1	LIBB	32809S003	1	2.9	0.2	2.7	0.6	99: 36	---	DORIS	
DJIA	39901S002	1	DJIB	39901S003	1	0.0	0.2	-0.1	-0.2	0:183	---	DORIS	
THTI	92201M009	2	PAPB	92201S007	1	-1.3	1.7	4.4	1.3	7:278	---	DORIS	
DUM1	91501M001	2	ADFB	91501S003	1	-5.0	-3.0	3.3	1.3	8: 39	---	DORIS	
DUM1	91501M001	2	ADEB	91501S002	1	-0.2	-0.2	1.3	0.1	8: 39	---	DORIS	
DJIA	39901S002	1	DJIB	39901S003	1	-0.1	0.3	0.0	-0.2	6:178	---	DORIS	
GOMA	40405S005	1	GOMB	40405S037	1	2.1	0.1	-2.8	-2.8	96:244	---	DORIS	
MONP	40497M004	5	MONB	40497S008	1	3.1	-4.7	-0.8	4.0	5:335	---	DORIS	
AMSA	91401S001	1	AMTB	91401S003	1	-1.2	2.3	3.4	-2.5	3:326	---	DORIS	
CROB	91301S001	1	CRPB	91301S002	1	-1.2	1.1	0.4	0.4	7: 96	---	DORIS	
GLPS	42005M002	1	SCRB	42005S001	1	-2.8	-1.0	-1.1	1.4	5: 92	---	DORIS	
CHAT	50207M001	1	CHAB	50207S001	1	0.1	0.6	-3.3	-0.6	99: 56	---	DORIS	
KERG	91201M002	2	KERB	91201S003	1	-3.2	-2.2	2.0	-2.9	7:101	---	DORIS	
BELB	66018S001	1	BEMB	66018S002	1	-0.3	0.3	-5.0	-0.3	5: 42	---	DORIS	
ROTA	66007S001	1	ROTB	66007S002	1	1.1	0.9	0.2	-1.3	5: 54	---	DORIS	
DIOA	12602S011	1	7515	12602M002	1	3.5	-4.7	1.8	-5.5	6:136	---	DORIS	*
SYOG	66006S002	1	SYOB	66006S001	1	-3.4	0.4	-47.5	3.1	0: 1	--*	DORIS	
NYA1	10317M003	2	SPIA	10317S002	1	-3.7	-1.8	-7.2	-2.3	3:228	--*	DORIS	
NOUM	92701M003	3	NOUA	92701S001	1	-0.9	0.2	6.0	0.1	5:236	--*	DORIS	
METS	10503S011	1	META	10503S013	1	4.3	0.1	-11.0	-0.7	0:299	--*	DORIS	
METS	10503S011	1	METB	10503S015	1	-3.1	2.6	-7.8	3.3	0:299	--*	DORIS	
TLSE	10003M009	2	TLHA	10003S003	1	-2.5	-1.6	-8.0	0.9	4: 34	--*	DORIS	
THTI	92201M009	2	PATB	92201S010	1	-3.2	0.2	6.4	-1.4	7:278	--*	DORIS	
AOML	49914S001	1	MIAB	49914S003	1	4.5	-3.5	-11.1	2.0	5: 36	--*	DORIS	
AMTB	91401S003	1	AMUB	91401S004	1	-0.5	-4.6	-7.9	-7.8	7:108	--*	DORIS	*
THTI	92201M009	2	PAQB	92201S008	1	1.6	4.9	10.1	5.6	7:278	--*	DORIS	*
SEY1	39801M001	3	MAHB	39801S005	1	-2.3	-1.2	-94.1	7.2	1:152	--*	DORIS	*
NYA1	10317M003	2	SPIB	10317S004	1	-1.2	5.7	2.2	-3.6	3:228	-*-	DORIS	
YSSK	12329M003	2	SAKB	12329S002	2	2.3	-5.0	-2.3	5.0	4:231	-*-	DORIS	
REYK	10202M001	4	REZB	10202S003	1	2.9	-6.2	1.0	0.7	4:248	-*-	DORIS	

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NOUM 92701M003  3 NOUB 92701S002  1    0.5   5.8   2.2   0.1  5:236 -*- DORIS
KIT3 12334M001  1 KIUB 12334S006  1    1.1   7.7  -2.6  -6.0  1:115 -*- DORIS *
MANA 22006S001  1 MANB 22006S002  1    4.7 -11.7   0.7  -7.1  3: 54 -*- DORIS *
RIOG 41507M004  2 RIPB 41507S005  1    3.3  -7.0   3.9   7.4  1: 15 -*- DORIS *
HRAO 30302M004  1 HBKA 30302S202  1    2.5 -15.6  -7.9  -0.6  3:214 -** DORIS
RIOG 41507M004  2 RIOB 41507S004  1   -4.4  11.0  -6.0  -4.4  1: 15 -** DORIS
STR1 50119M002  3 MSPB 50119S004  1   -4.3   5.3   6.8  -4.3  1:209 -** DORIS
STJO 40101M001  5 STJB 40101S002  1    3.0  14.2   7.6   2.5 99:269 -** DORIS
RIOG 41507M004  2 RIOA 41507S003  1    0.1   5.5  18.7  -2.8  1: 15 -** DORIS
YAR1 50107M004  3 YARB 50107S010  1    0.9  15.6  13.4   9.2  3:305 -** DORIS *
YAR1 50107M004  3 YASB 50107S011  1   -2.8  10.0   6.7  10.5  3:305 -** DORIS *
RIDA 40499S016  1 7295 40499M002  1    2.4  -9.5 -41.5   9.8 93:  4 -** DORIS *
MONP 40497M004  5 MOOB 40497S009  1   -2.4 -12.3 -11.4  11.6  5:335 -** DORIS *
AREQ 42202M005  1 AREA 42202S005  1    1.2 -15.2  40.8  13.4 95:  1 -** DORIS *
TRIA 30604S001  2 TRIB 30604S002  1    4.0 -15.3 -22.2  16.5  2: 23 -** DORIS *
BADA 12338S001  1 BADB 12338S002  1    2.5  -5.5  -8.2  -8.1  4:224 -** DORIS *
STR1 50119M002  3 MSOB 50119S002  3   -1.7   8.3   5.1  -7.7  1:209 -** DORIS *
MARA 30313S001  1 MATB 30313S003  1   -7.9   2.3   0.6   0.8  4:241 *-- DORIS
HRAO 30302M004  1 HBKB 30302S006  1    5.4  -1.0  -4.2   4.9  3:214 *-- DORIS
YELL 40127M003  3 YEMB 40127S009  1    9.6  -1.6   1.6   7.9  1:285 *-- DORIS *
YELL 40127M003  3 YELB 40127S008  1    9.1  -1.1  -4.3   7.5  1:285 *-- DORIS *
SYOG 66006S002  1 SYPB 66006S003  1    9.9   1.7  -2.4  -5.3  0:  1 *-- DORIS *
BAKO 23101M002  4 CIBB 23101S001  1   10.8  -1.8  49.9  -0.3  0:350 *-* DORIS
SANT 41705M003  2 SANA 41705S007  1    9.8   2.2 -22.6   2.0 96:339 *-* DORIS
REUN 97401M003  1 REUA 97401S001  1    5.7   4.0 -10.7  -4.3  3:335 *-* DORIS
SANT 41705M003  2 SAOB 41705S008  1   14.6   0.8  29.4   0.0 96:339 *-* DORIS
NKLG 32809M002  1 LIBA 32809S002  1   15.7  -2.6  22.3   1.0 99: 36 *-* DORIS
KERG 91201M002  2 KESB 91201S004  1    6.3   1.2   7.3  -1.7  7:101 *-* DORIS
GUAM 50501M002  1 GUAB 50501S001  1   14.6  -0.5  24.2  10.4 93:346 *-* DORIS *
THU3 43001M002  1 THUB 43001S005  1   26.1   1.2  -7.6  16.0  2:257 *-* DORIS *
FAIR 40408M001  2 FAIB 40408S005  1   14.6  -4.9 -16.5  -9.2  1:274 *-* DORIS *
BAKO 23101M002  4 CICB 23101S002  1   -9.4   1.2  43.3   6.0  0:350 *-* DORIS *
SANT 41705M003  2 SANB 41705S009  1   -8.7   4.9  38.6   6.5 96:339 *-* DORIS *
ASC1 30602M001  1 ASDB 30602S004  1   29.1   3.7 -17.0  28.3  3:350 *-* DORIS *
MARA 30313S001  1 MARB 30313S002  1  -19.8   7.8   3.7   4.7  4:241 **- DORIS
REYK 10202M001  4 REYA 10202S001  1  -10.7 -10.7   3.1   2.6  4:248 **- DORIS
REYK 10202M001  4 REYB 10202S002  1   14.5  -9.4   1.6 -17.3  4:248 **- DORIS *
PDEL 31906M004  1 PDLB 31906S001  1   16.1   9.7   3.6 -18.0  1: 79 **- DORIS *
EISL 41703M003  1 EASB 41703S009  1   18.6   7.0  -4.4  -6.2  1: 46 **- DORIS *
KIT3 12334M001  1 KITB 12334S005  1   -5.2  10.3  -1.5  -7.6  1:115 **- DORIS *
DUM1 91501M001  2 ADEA 91501S001  1   -8.8 -10.1   4.9  -9.3  8: 39 **- DORIS *
AREQ 42202M005  5 ARFB 42202S007  1  -28.8  28.4  -4.6  -5.1  7:123 **- DORIS *
ADEA 91501S001  1 ADEB 91501S002  1    8.5   9.5  -1.7  -8.7  2:104 **- DORIS *
KOKB 40424M004  4 KOKA 40424S008  1   12.6  10.9   0.1 -12.4  2:319 **- DORIS *
WUHN 21602M001  2 JIUB 21602S005  1   -6.6 -30.5  51.9  -2.2  3:342 *** DORIS
KSTU 12349M002  1 KRAB 12349S001  1    7.7   9.1  10.1  -4.9  0:  1 *** DORIS
KIT3 12334M001  1 KITA 12334S004  1  -11.6   7.7  -7.2  -3.1  1:115 *** DORIS
HRAO 30302M004  1 HBLA 30302S005  1    5.3  -6.2 -13.3   3.3  3:214 *** DORIS
TIDB 50103M108  2 ORRB 50103S202  1  -26.3 -33.6 -32.1  36.1 95:263 *** DORIS *
TIDB 50103M108  2 ORRA 50103S201  1  -30.1 -39.0 -29.4  42.1 95:263 *** DORIS *
MALD 22901S001  1 MALB 22901S002  1   -9.6  13.8  18.1   9.4  5: 14 *** DORIS *
RIDA 40499S016  1 7219 40499S001  1   10.3 -26.3 -60.7  28.0 93:  4 *** DORIS *
NOUM 92701M003  3 NOWB 92701S003  1    6.3  19.3  26.9  15.5  5:236 *** DORIS *
CHPI 41609M003  1 CACB 41609S001  1   20.6  -8.8 -48.5 -20.9  4: 85 *** DORIS *
CHPI 41609M003  1 CADB 41609S002  1   -6.5   9.6 -76.7  11.1  4: 85 *** DORIS *
PDEL 31906M004  1 PDMB 31906S002  1   10.9   8.2 -12.3 -11.4  1: 79 *** DORIS *
EISL 41703M003  1 EASA 41703S008  1  -11.7  10.5 -17.6  13.8  1: 46 *** DORIS *
MORA 51001S001  1 MORB 51001S002  1   -7.6  15.4  15.3   9.9  2: 79 *** DORIS *
KERG 91201M002  2 KETB 91201S005  1    6.7   8.6   8.9  -8.9  7:101 *** DORIS *
KOKB 40424M004  4 KOLB 40424S009  1    9.1  15.6 -12.4 -16.8  2:319 *** DORIS *
GODE 40451M123  2 GREB 40451S176  1    9.9 -17.0 -11.6  10.4  8:  1 *** DORIS *
HELA 30606S002  1 HELB 30606S003  1   19.1  25.2 -11.5 -14.8  3: 80 *** DORIS *
HELA 30606S002  1 HEMB 30606S004  1   10.5  41.0 -16.2 -32.0  3: 80 *** DORIS *
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