INTRODUCTION

The Sets of Stations Coordinates (SSC) received for the ITRF94 analysis are organized in two classes, I and II. Three criteria are of specific interest:

1. Relationship with EOP

Three main approaches can be used in the analysis procedure, leading to three types of SSC solutions: primary, densified, and autonomous, as follows.

A) Combined adjustment of SSC and EOP: *primary* SSC solution.

B) Rigorous combination of SSC from A and an extended set of stations for which EOP are fixed to the result from A (in other words not all of the stations do contribute to EOP determination): *densified* SSC solution.

C) Adjustment with fixed series of EOP: *autonomous* SSC solution.

Providing that EOP documentation is also submitted, all three types of solution can be accepted as Class I.

2. Type of data

We may characterize the solutions according to:

a) monotechnique/mono-satellite, or

b) monotechnique/multi-satellite, with two cases:
  - b1) combination of SSC and EOP from monosatellite solutions,
  - b2) simultaneous analysis of data from the various satellites with a unique model;

c) multitechnique, with:
  - c1) combination of SSC and EOP,
  - c2) simultaneous analysis.

For this solution, we accepted any type of solution.

3. Informations submitted with the SSC

For Class I solutions we require data transmission in SINEX format. We accept in general positions and velocities either free or constrained.

In summary the criteria for Class I solutions are as follows:

- Availability of positions (and velocities) with full covariance matrix (SINEX)

- Good quality of the global solution (individual poorly determined stations are accepted)

- All possible stations should be included (possibility of solutions of types A, B or C, see above).

All other solutions are considered as Class II.

The ITRF94 solution is based on a combination of Class I individual solutions. This combination includes VLBI, GPS, SLR and DORIS solutions. Note that DORIS results are included for the first time in the ITRF computations. The Class II solutions are all compared a posteriori to the ITRF94 solution.

Table 1 lists all the solutions received by the IERS Central Bureau for the ITRF94 analysis.

Table 1: Received Data

		Solution	Epoch	Velocities(1) Est.	Fix.	Cst.	Sta. Nb.	Matrix format	Class
VLBI	RG	SSC(GSFC) 95 R 01	1988.0	90	44		134	ISEF1	I
	RN	SSC(NOAA) 95 R 01	1993.0	81	30		111	NOAA	I
	RJ	SSC(JPL) 95 R 01	1993.0	9		3	12	ISEF1	I
	RO	SSC(USNO) 95 R 04	1993.0	56	25		81	USNO	I
	RK	SSC(GAOUA)95 R 01	1993.0		18		18	ISEF1	II
	RS	SSC(SHA) 95 R 01	1993.0		18		18	---	II
GPS	JP	SSC(JPL) 95 P 02	1993.0	50			50	ISEF1	I
	PE	SSC(EMR) 95 P 02	1994.0	13	13		26	ISEF1	I
	PB	SSC(CODE) 95 P 02	1994.3			69	69	ISEF1	I
	PZ2	SSC(GFZ) 95 P 02	1994.0		47		47	---	II
	PZ3	SSC(GFZ) 95 P 03	1994.0	34	13		47	ISEF1	II
	PA	SSC(ESOC) 95 P 01	1994.0	41			41	ISEF1	II
SLR	LC	SSC(CSR) 95 L 01	1993.0	47	70		117	ISEF1	I
SLR+GPS	CU	SSC(DUT) 95 C 02	1988.0	53	42		95	ISEF1	I
	LK	SSC(GAOUA)95 L 01	1993.0	48	43		91	ISEF1	II
	LG	SSC(GSFC) 95 L 01	1988.0	40			40	---	II
	LZ	SSC(GFZ) 95 L 01	1988.0	51	25		76	ISEF1(2)	II
	LY	SSC(IARAS)95 L 01	1994.0		20		20	---	II
	LL1	SSC(CLG) 95 L 01	1984.0	46			66	ISEF1	II
	LL2	SSC(CLG) 95 L 02	1984.0	46			66	ISEF1	II
DORIS	DR	SSC(GRGS) 95 D 01	1993.0	42	7		49	ISEF1	I
	DH	SSC(IGN) 95 D 02	1993.0	56			56	ISEF1	I
	DC	SSC(CSR) 95 D 01	1993.0	47			47	ISEF1	I
LLR	MX	SSC(UTXMO)95 M 01	1984.0		5		5	---	II
	MJ	SSC(JPL) 95 M 01	1991.0		5		5	---	II
	MV	SSC(FSG) 95 M 01	1991.94		5		5	ISEF1	II
	MS	SSC(SHA) 95 M 01	1993.0				4	---	II

Notes.

1- Status of the velocities: estimated (Est.), fixed (Fix.) or constrained (Cst.). The numbers of stations with this status are listed.

2- Matrix in local frame.

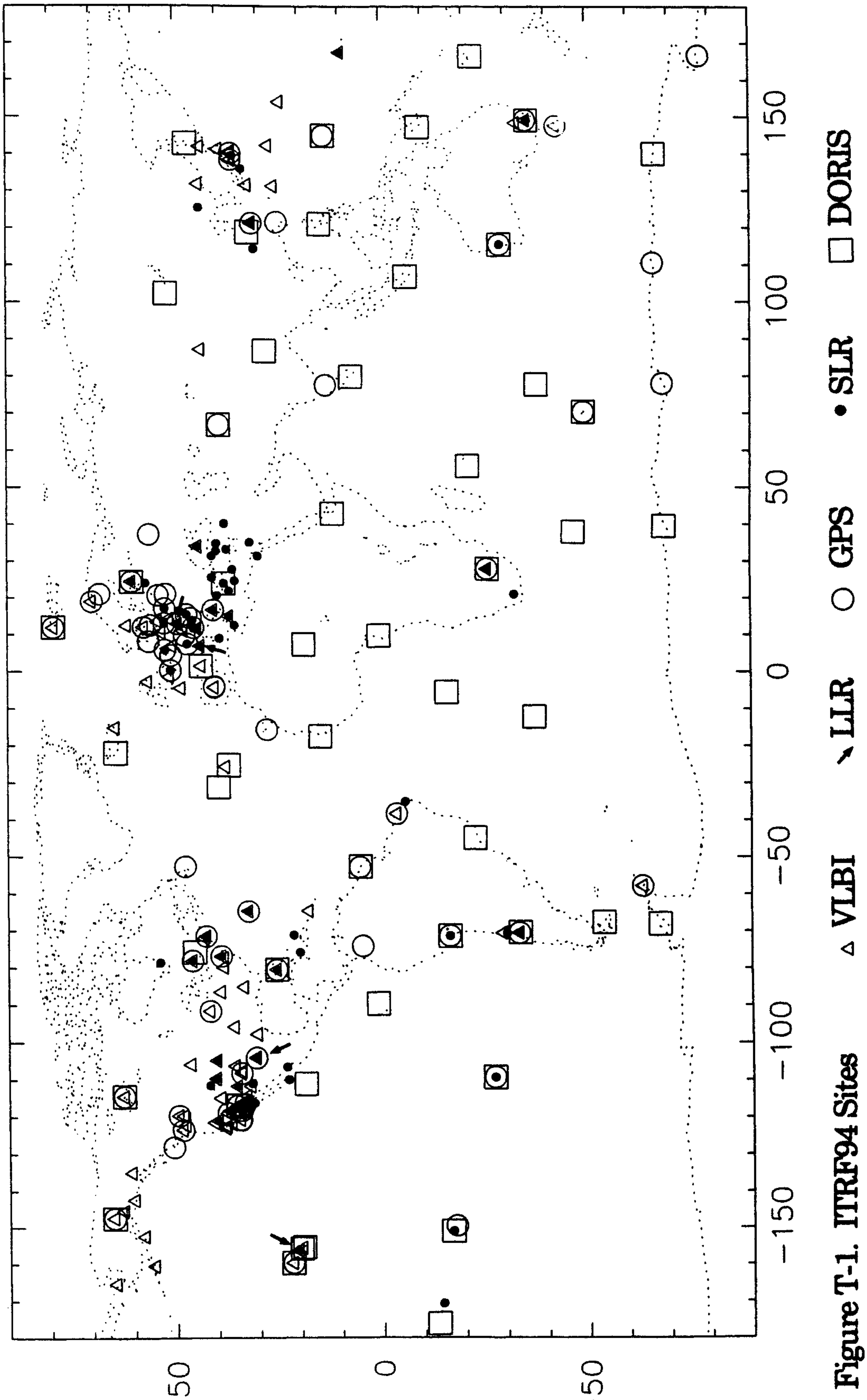

Figure 1. ITRF94 sites

General information Tables are given in the Appendix:

Table T1: list of the IERS sites;
Table T2: list of points and markers for the IERS sites;
Table T3: summary of the occupancies of the IERS sites by VLBI, LLR, GPS, SLR and DORIS;
Table T4: local eccentricities for the IERS sites.

ANALYSIS PER TECHNIQUE OF CLASS I SOLUTIONS

In order to assess the relative quality of the different solutions independently from the influence of the local ties, analyses restricted to combinations and comparison within each observing technique are performed, based on a seven transformation parameters model. Two specific parameters are considered:

- the Factor of Unit Variances (SIG0) of an entire comparison/combination, and

- the Factor of Unit Variances per solution (labelled NSX2, see below), computed by taking into account the correlations between the estimated parameters.

These analyses also lead to the estimation of the Matrix Scaling Factor.

One expects that the SIG0 be 1 and that the values of NSX2 of the solutions incorporated in the comparison/combination be equal to each other and not far from the unity. Practically, these two conditions could be easily satisfied in case of two solutions, by repeating the comparison and varying the Matrix Scaling Factors till we have identical NSX2 for the two solutions. But the two conditions are more difficult to satisfy in case of three or more solutions. In this second case, two types of analysis per pair of solutions have been performed:

- comparisons per pair of solutions over all common points,

- comparisons per pair of solutions over common points of the three solutions.

Based on these two types of analysis, one combination per technique has been adopted as optimal combination, yielding to the Matrix Scaling Factor for each individual solution. Tables 2 to 5 list the statistical numbers for each optimal combination per technique. Note that all these combinations were performed at epoch 1993.0. The captions of these tables are:

N : Number of common points

SP : 2-D unweighted RMS

SU : Vertical unweighted RMS

SX : 3-D unweighted RMS

WSP : 2-D Weighted RMS

WSU : Vertical Weighted RMS

WSX : 3-D Weighted RMS

NSX1 : Factor of Unit Variances per solution, without taking into account the correlations between the estimated parameters

NSX2 : Factor of Unit Variances per solution, taking into account the correlations between the estimated parameters

F : Matrix Scaling Factor