

Quality assessment of the ITRF2008

Still preliminary but close to final



Zuheir Altamimi
Xavier Collilieux
Laurent Métivier
IGN, France



Technique contributions

- **IVS:** (1980.0 – 2009.0) : Full EOP set (84 sites)
- **IGS:** (1997.0 – 2009.5) : PM, PMrate, LOD (492 sites)
- **ILRS:** (1984.0 – 2009.0) : PM, LOD (89 sites)
- **IDS:** (1993.0 – 2009.0) : PM, LOD (67 sites)

- **New local ties since ITRF2005:**
 - Tahiti : GPS SLR DORIS
 - Tsukuba: GPS VLBI
 - Herstmonceux: GPS SLR
 - Medicina & Noto : GPS VLBI
 - Greenbelt: VLBI SLR GPS DORIS
 - MAUI/Haleakala
 - San Fernando : GPS SLR

- **Parallel analysis by IGN and DGFI**

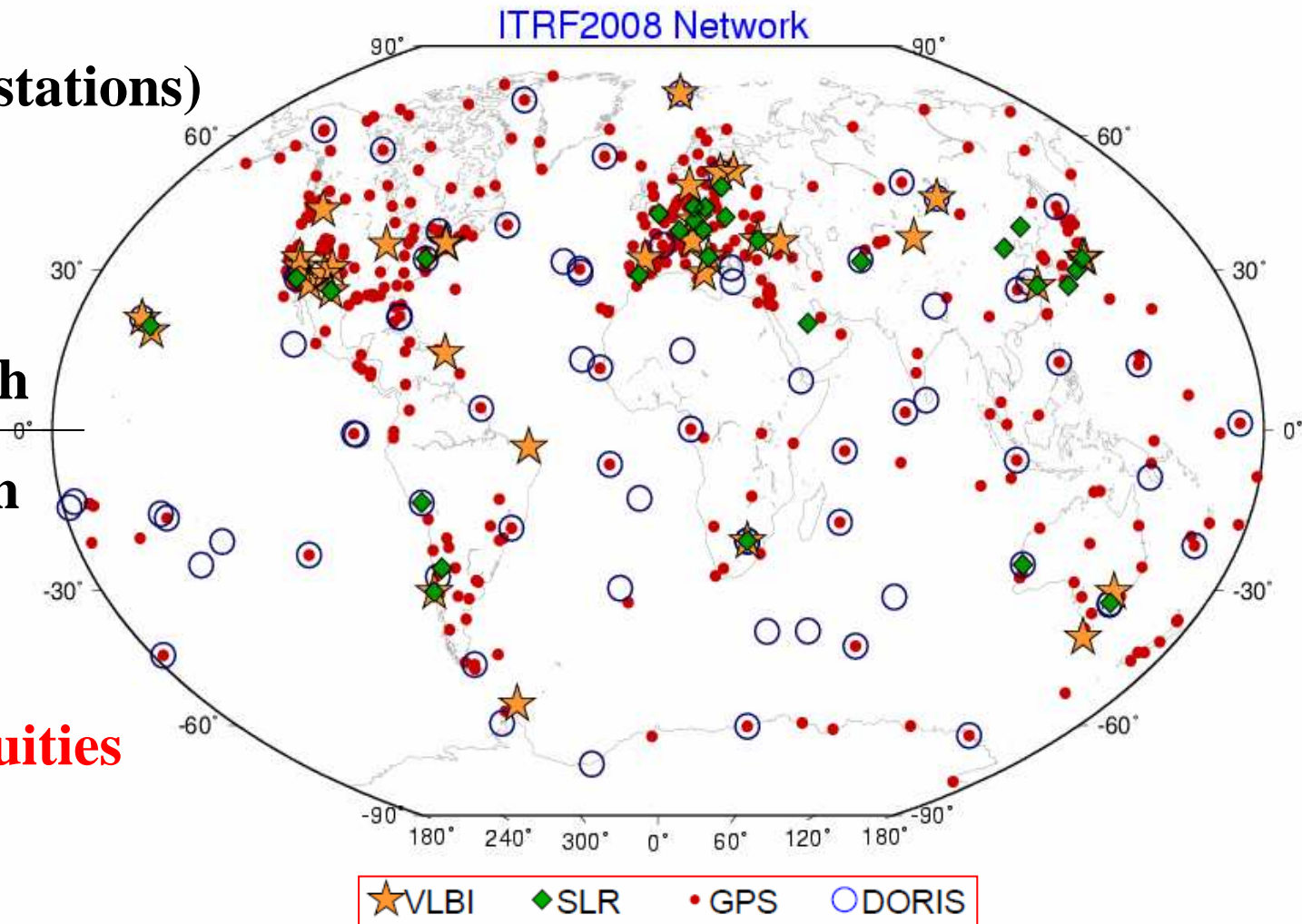
ITRF2008 Network

579 sites (920 stations)

461 Sites North

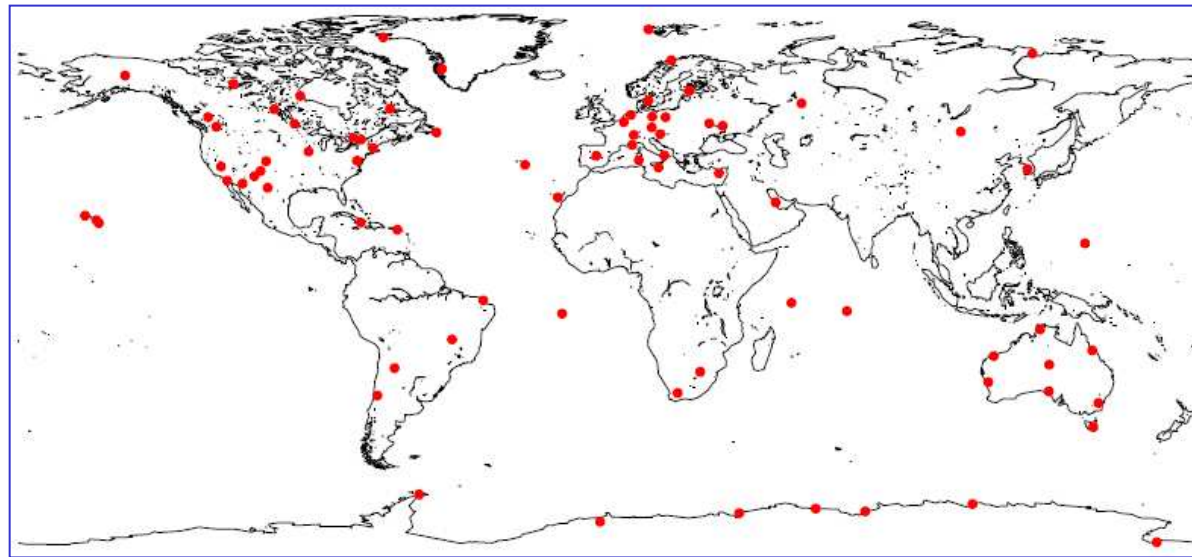
118 Sites South

584 discontinuities

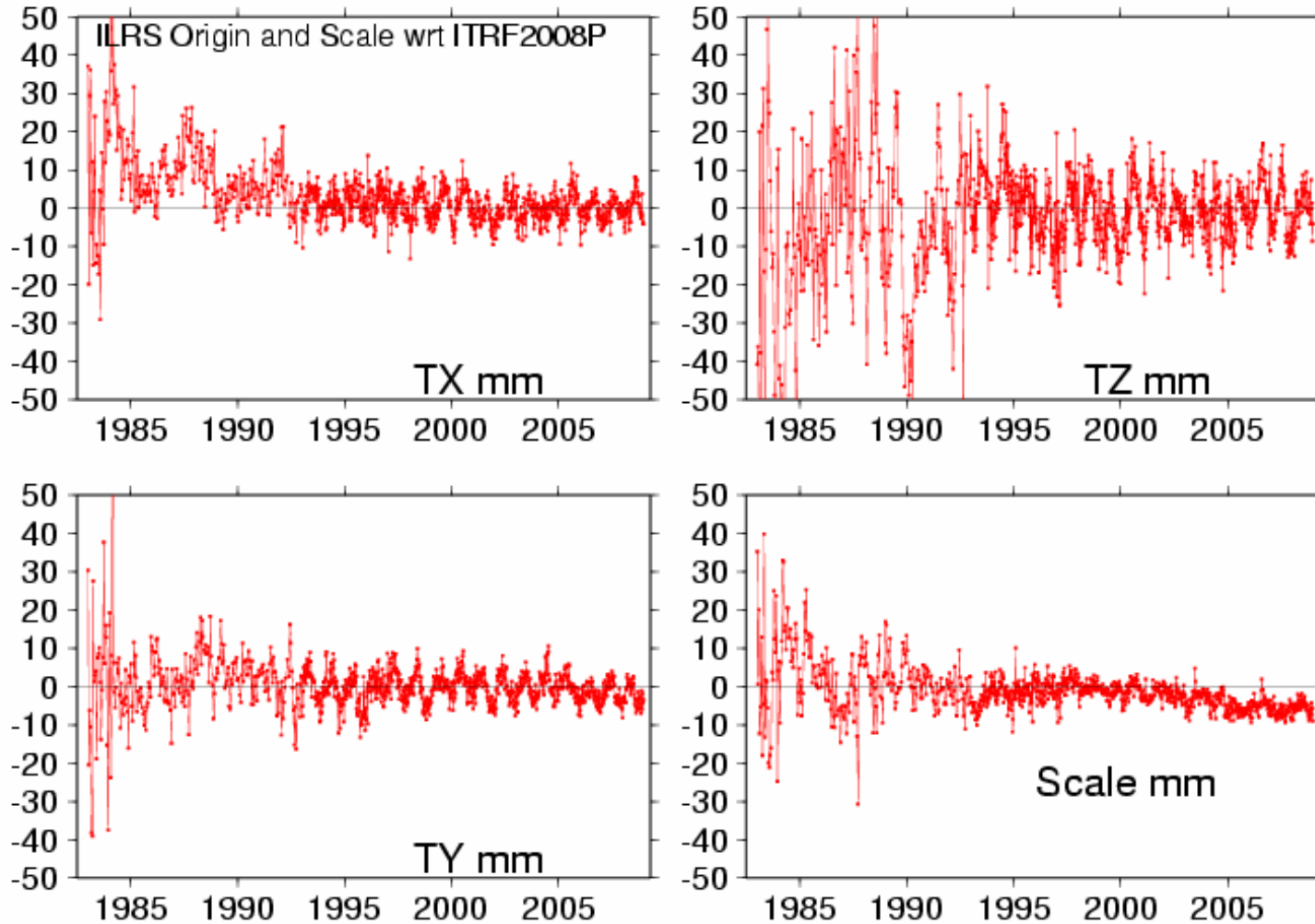


ITRF2008 Datum Specification

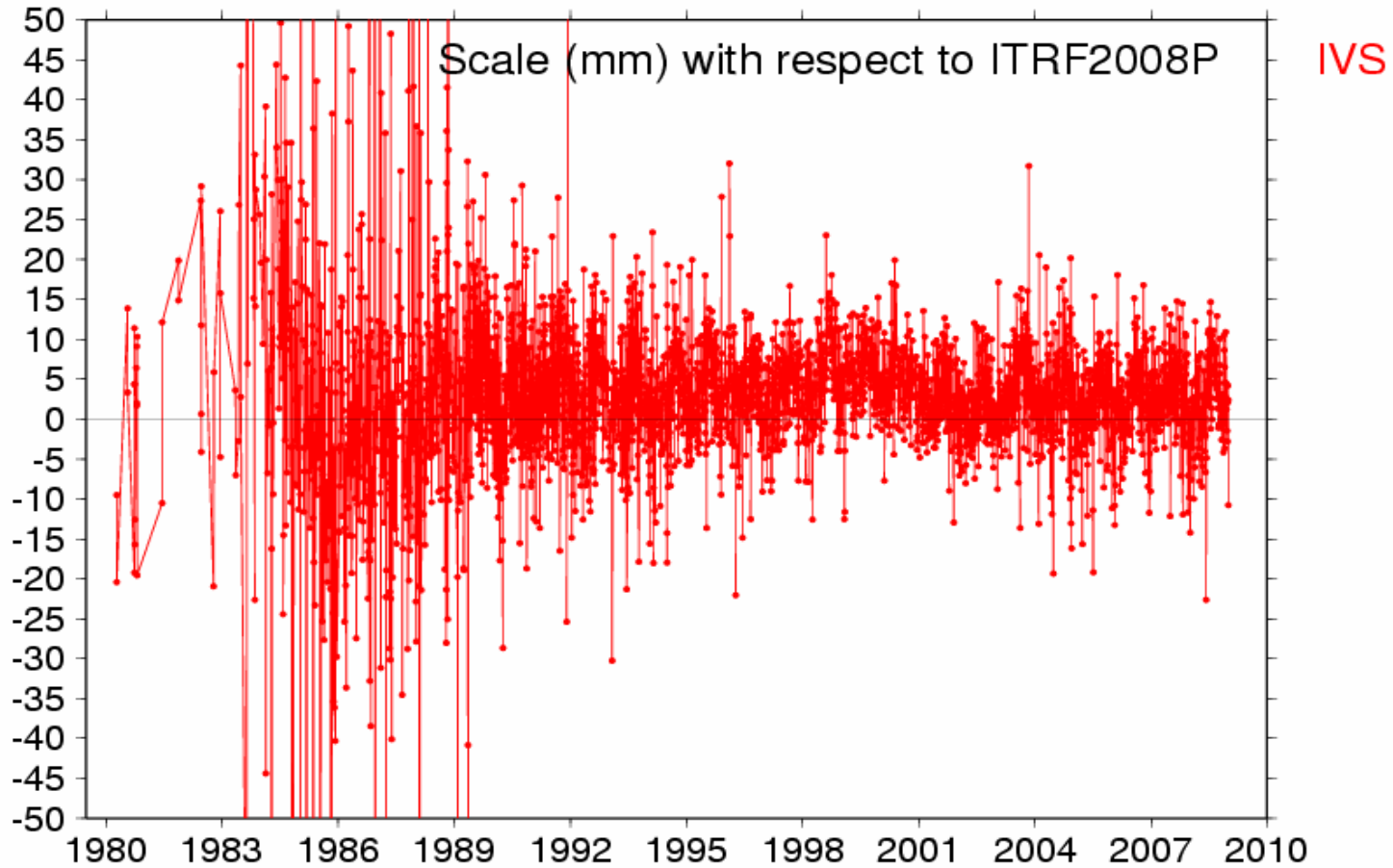
- **Origin: SLR**
- **Scale : Mean of SLR & VLBI**
- **Orientation: Aligned to ITRF2005 (orientation and its rate)**
using **95 stations located at 79 sites:**
 - **55 at northern hemisphere**
 - **24 at southern hemisphere**



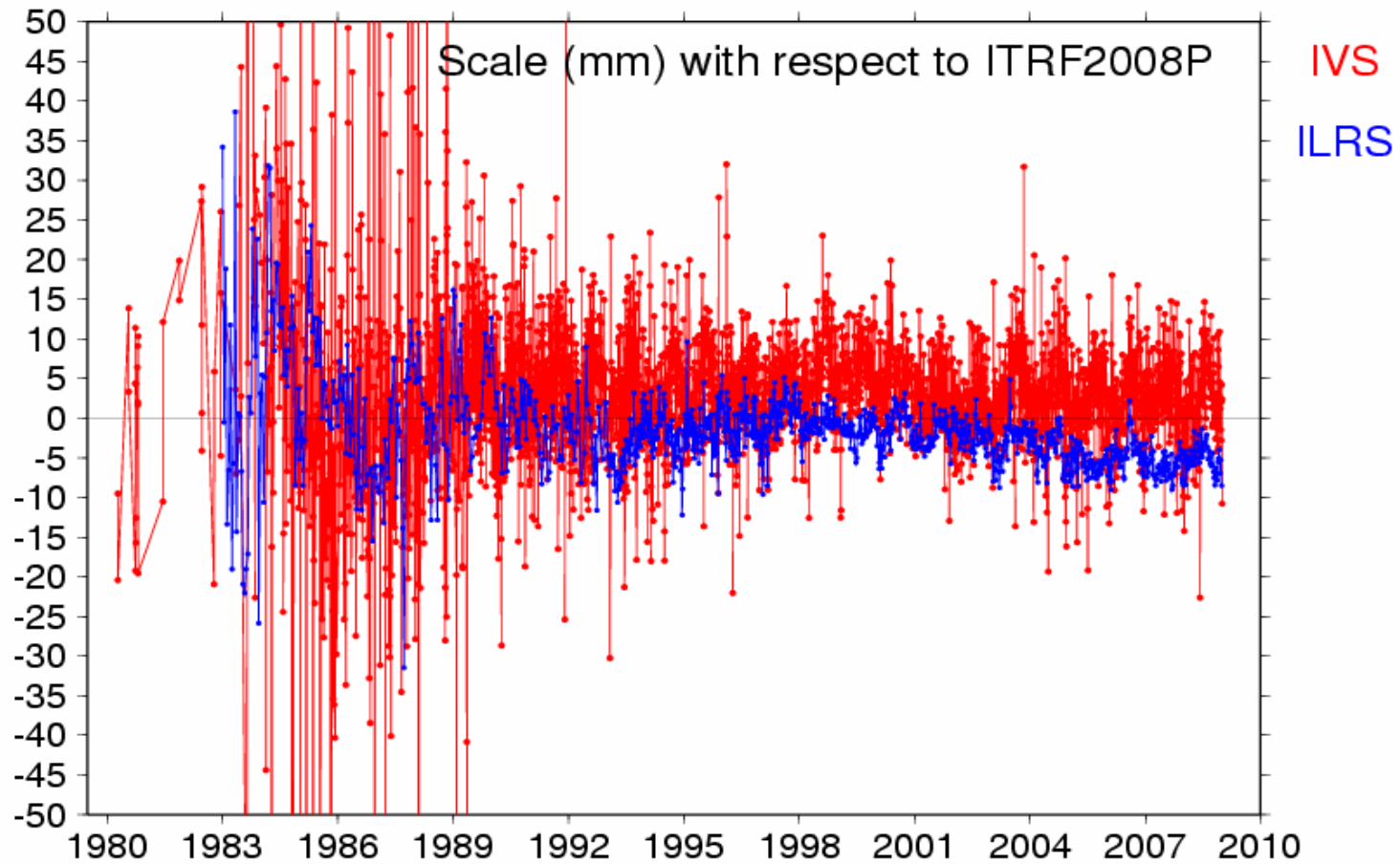
SLR/ILRSA24 Origin and Scale wrt ITRF2008P



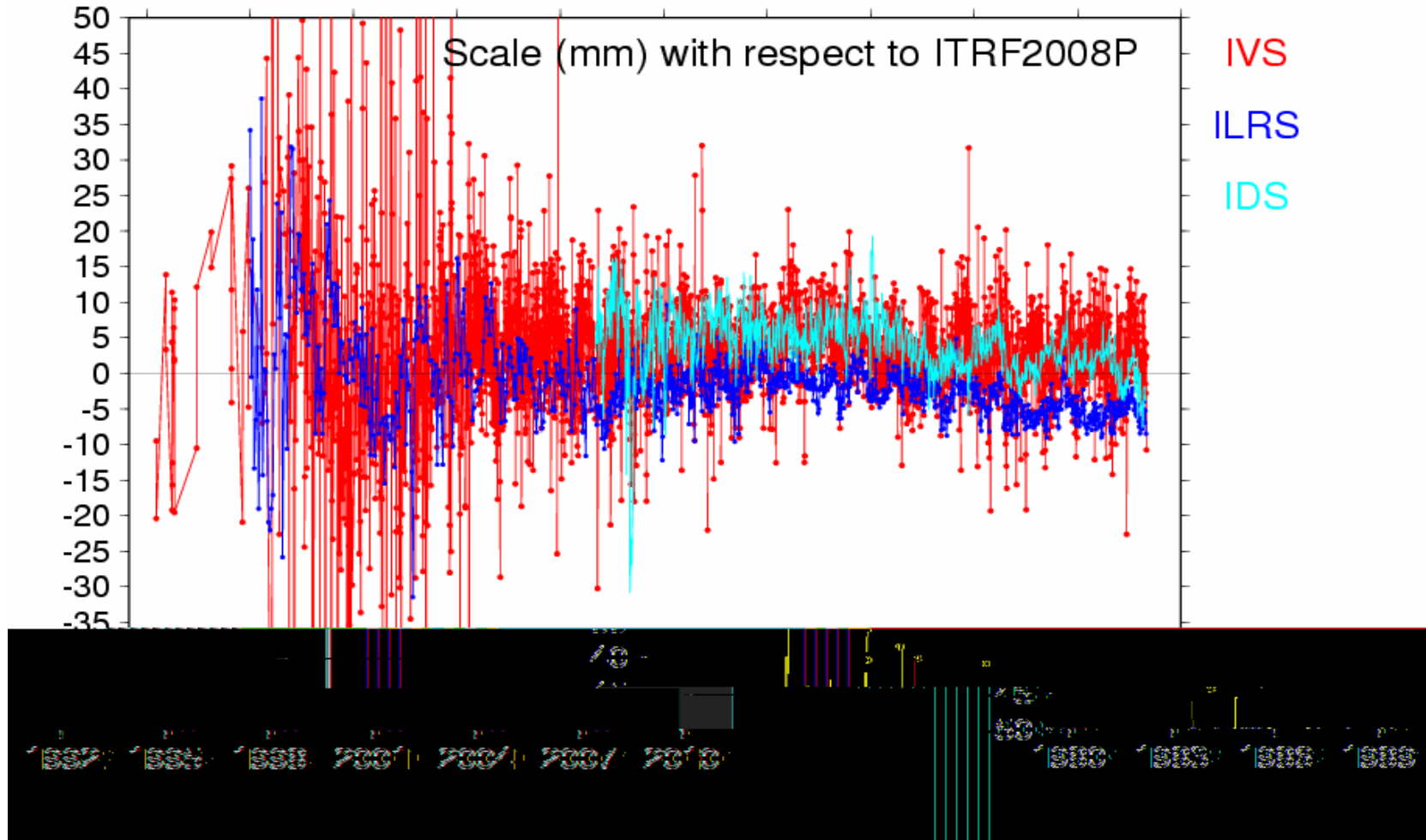
Scales wrt ITRF2008P



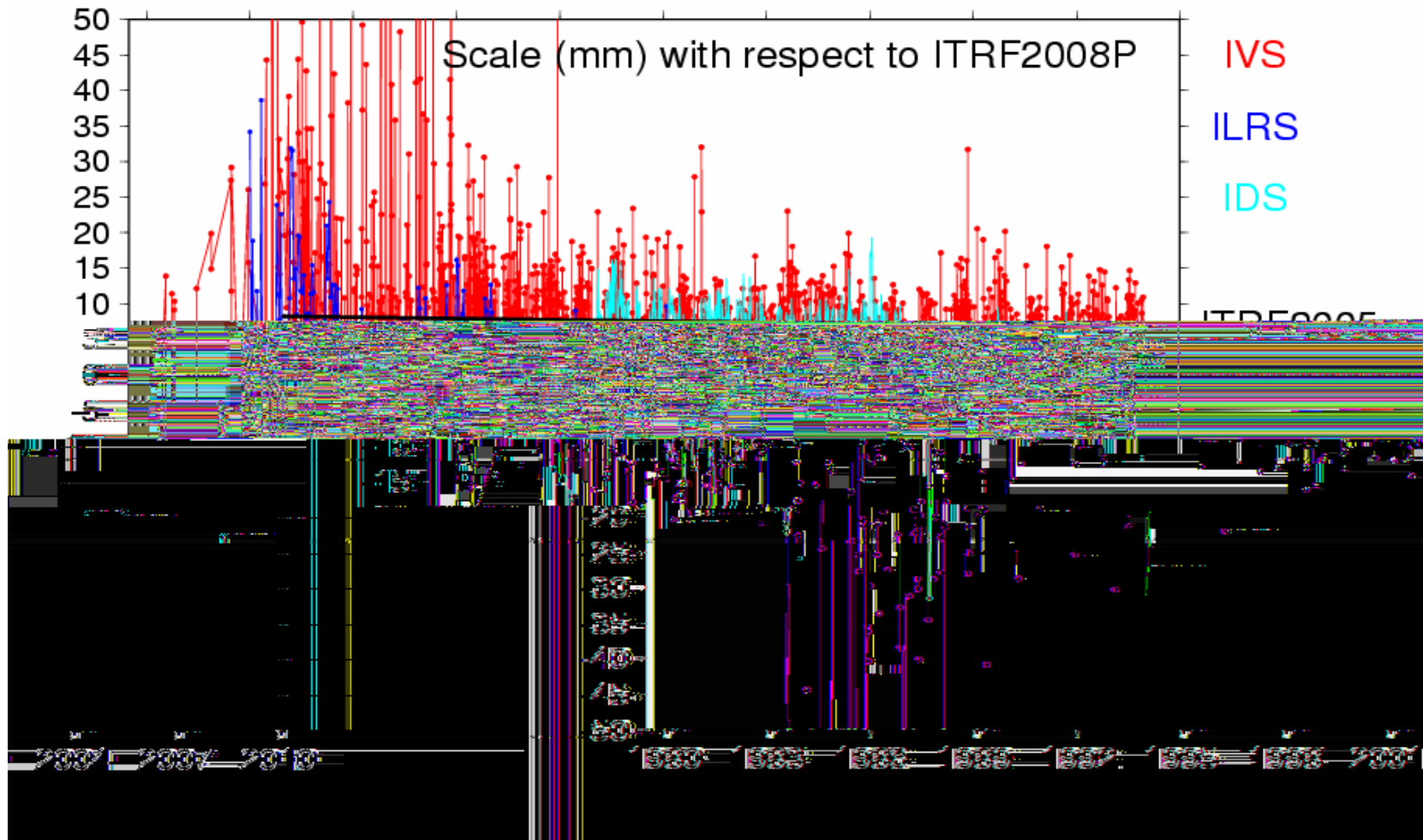
Scales wrt ITRF2008P



Scales wrt ITRF2008P



Scales wrt ITRF2008P



Scale FORMAL errors (1σ) via ties to GPS

	Scale ppb	Scale rate ppb/yr
VLBI	± 0.10	± 0.01
SLR	± 0.12	± 0.01
DORIS	± 0.20	± 0.03

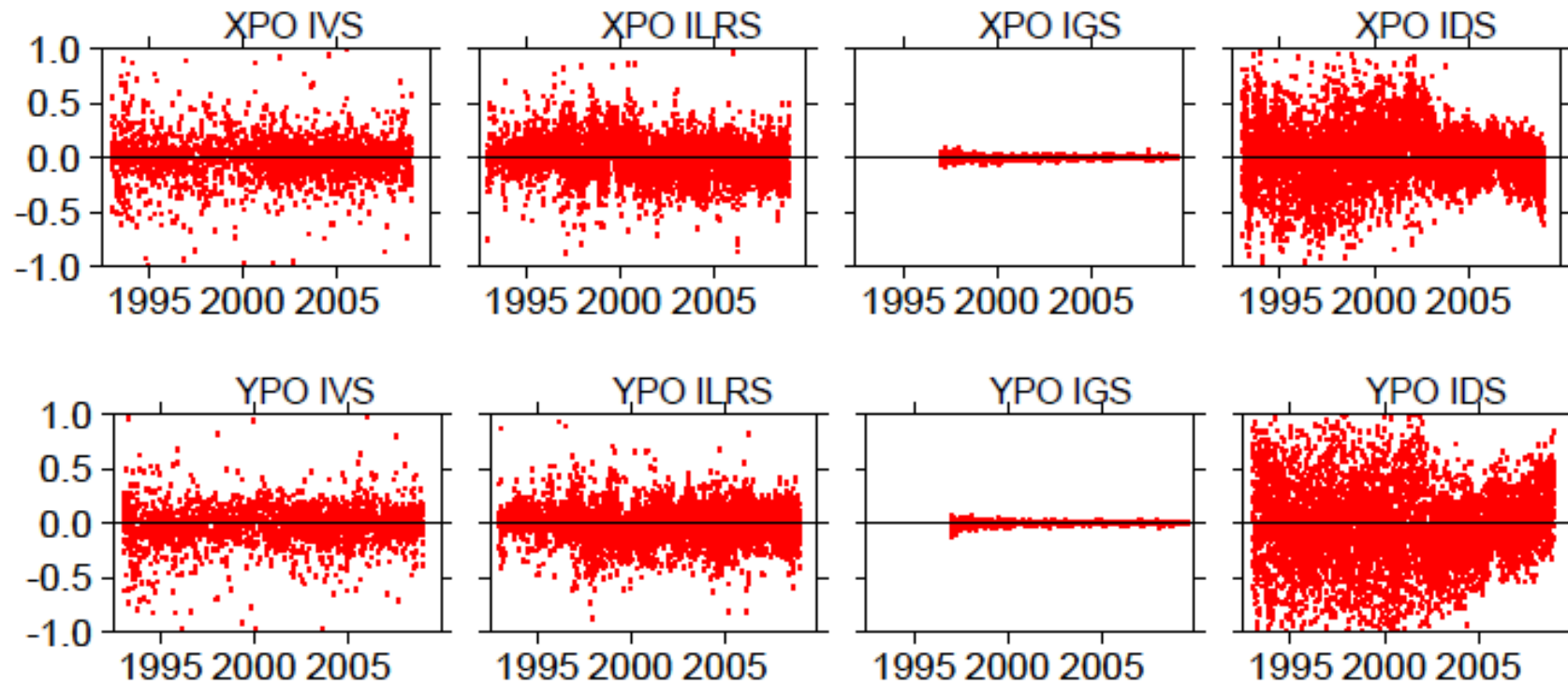
Transformation Param Fm ITRF2008P To ITRF2005

Tx mm	Ty mm	Tz mm	Scale ppb
-0.7 ± 0.5	-0.4 ± 0.5	-3.8 ± 0.5	1.14 ± 0.10

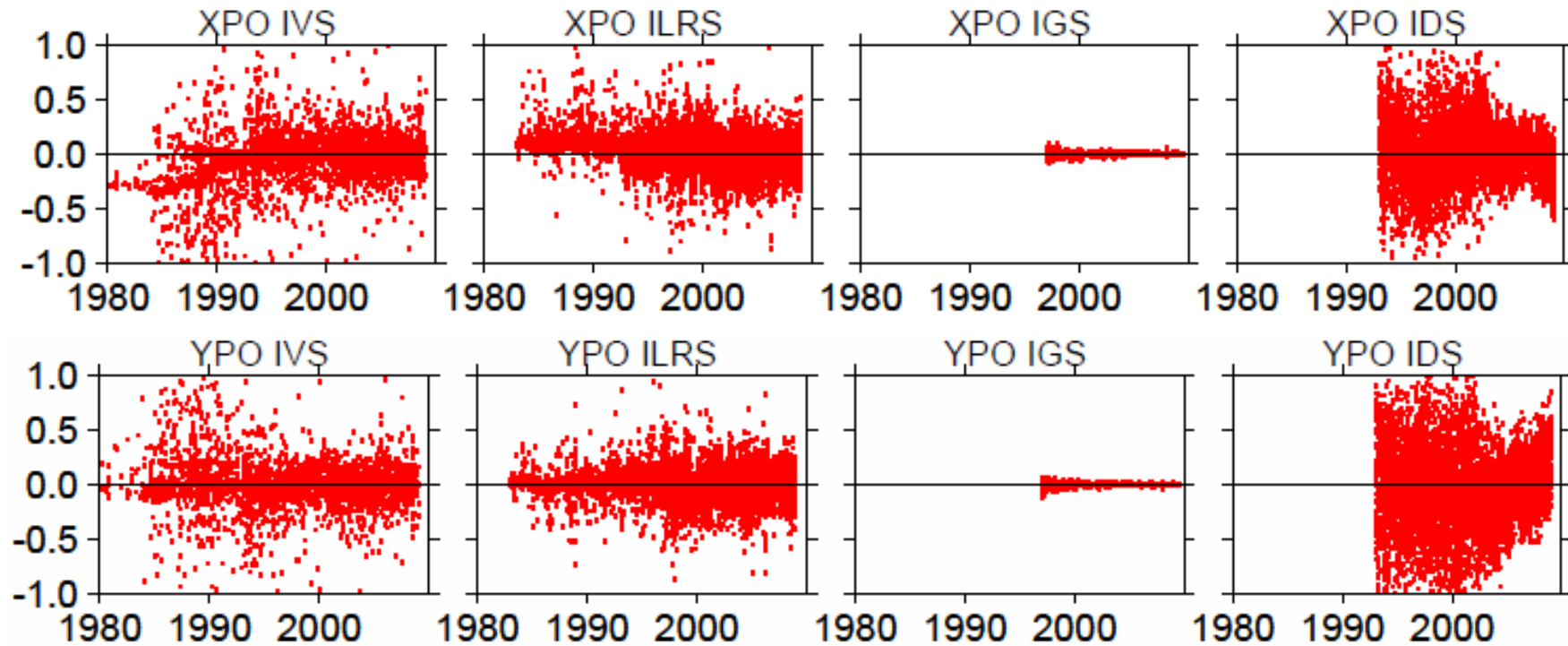
**At epoch
2005.0**

Tx rate mm/yr	Ty rate mm/yr	Tz rate mm/yr	Scale rate ppb/yr
0.2 ± 0.1	0.0 ± 0.1	-0.1 ± 0.1	-0.01 ± 0.01

ITRF2008P PM residuals



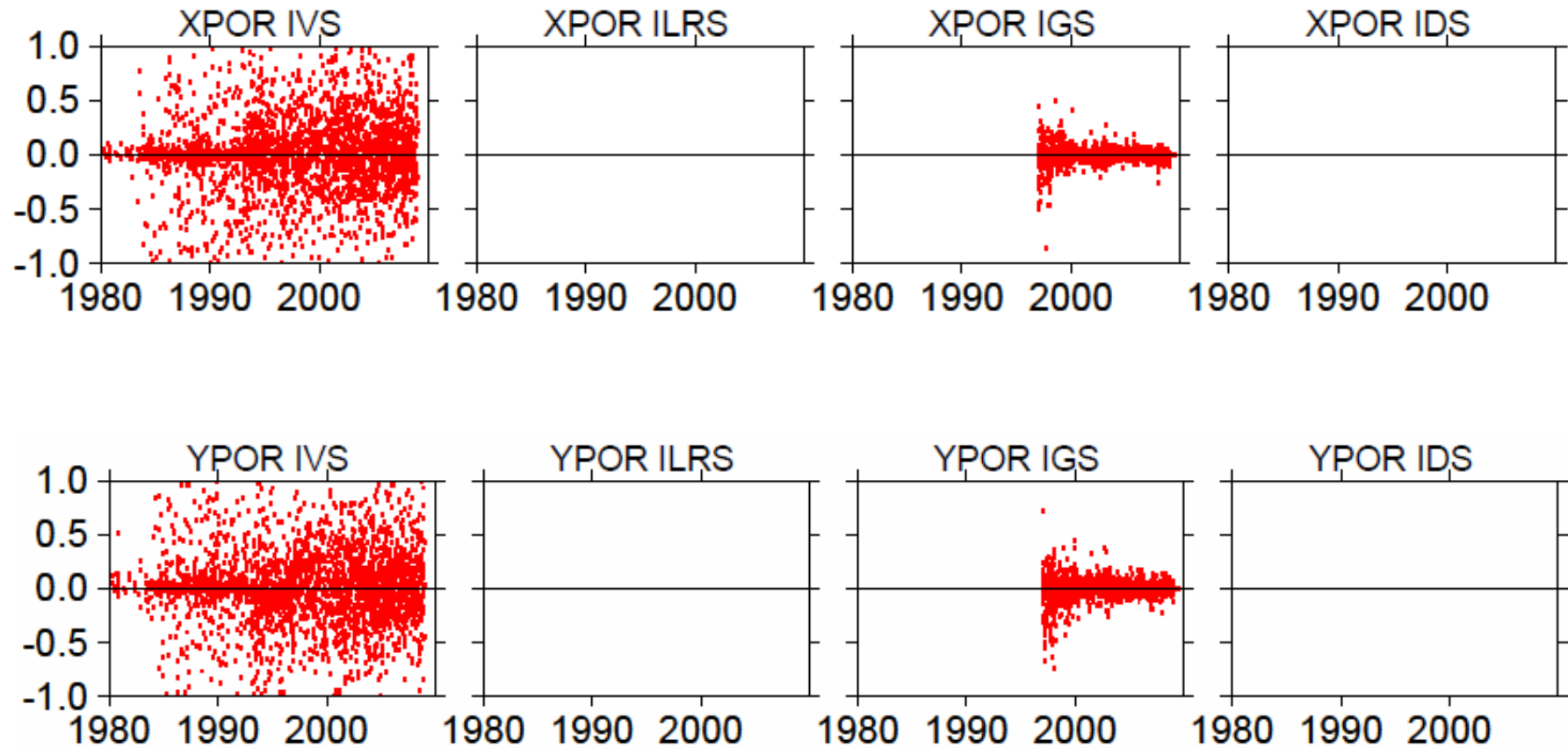
ITRF2008P PM residuals



WRMS in μas

	X-pole	Y-pole		X-pole	Y-pole
GPS	10	10	VLBI	142	120
DORIS	239	353	SLR	144	128

ITRF2008P PM rate residuals



Concluding remarks

- **ITRF2008: independent combination from ITRF2005**
 - **Origin: almost the same as ITRF2005:**
 - 3.8 mm at epoch 2005.0 along Z-axis
 - 0.2 mm/yr along X-axis
 - **Scale: mean of VLBI and SLR**
 - **Agreement between VLBI and SLR:**
 - 1.10 (± 0.13) ppb (at epoch 2005.0)
 - 0.06 (± 0.01) ppb/yr
 - **Diff (ITRF2005 – ITRF2008P):**
 - +1.14 (± 0.10) ppb (at epoch 2005.0)
 - -0.01 (± 0.01) ppb/yr
- did we reach the limit of VLBI and SLR scale consistency ?