ITRF2005: evaluation of its consistency

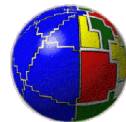**G. Bianco**
Agenzia Spaziale Italiana, CGS - Matera

V. Luceri
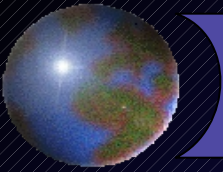**e-GEOS S.p.A., CGS - Matera**

R. Devoti
INGV, Rome

agenzia spaziale
italiana
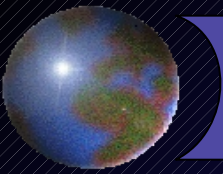
e-GEOS

Istituto Nazionale di
Geofisica e Vulcanologia

The ITRF datum

ITRF2005

- **origin and rates**: null translation parameters at epoch 2000.0 and null translation rates between the ITRF2005 and the ILRS SLR time series.
- **scale and rate**: null scale factor at epoch 2000.0 and null scale rate between the ITRF2005 and IVS VLBI time series.
- **orientation and rates**: null rotation parameters at epoch 2000.0 and null rotation rates between the ITRF2005 and ITRF2000.
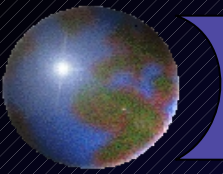
ITRF2000

- **origin and rates** : weighted average of SLR solutions (CGS, CRL, CSR, DGFI, JCET)
- **scale and rates** : weighted average of the following VLBI and SLR solutions
  - VLBI: GIUB, GSFC, SHA
  - SLR: CGS, CRL, CSR, DGFI, JCET
- **orientation and rates**: null rotation parameters w.r.t ITRF97 at epoch 1997.0, no Net Rotation rates w.r.t. NNR-NUVEL1A
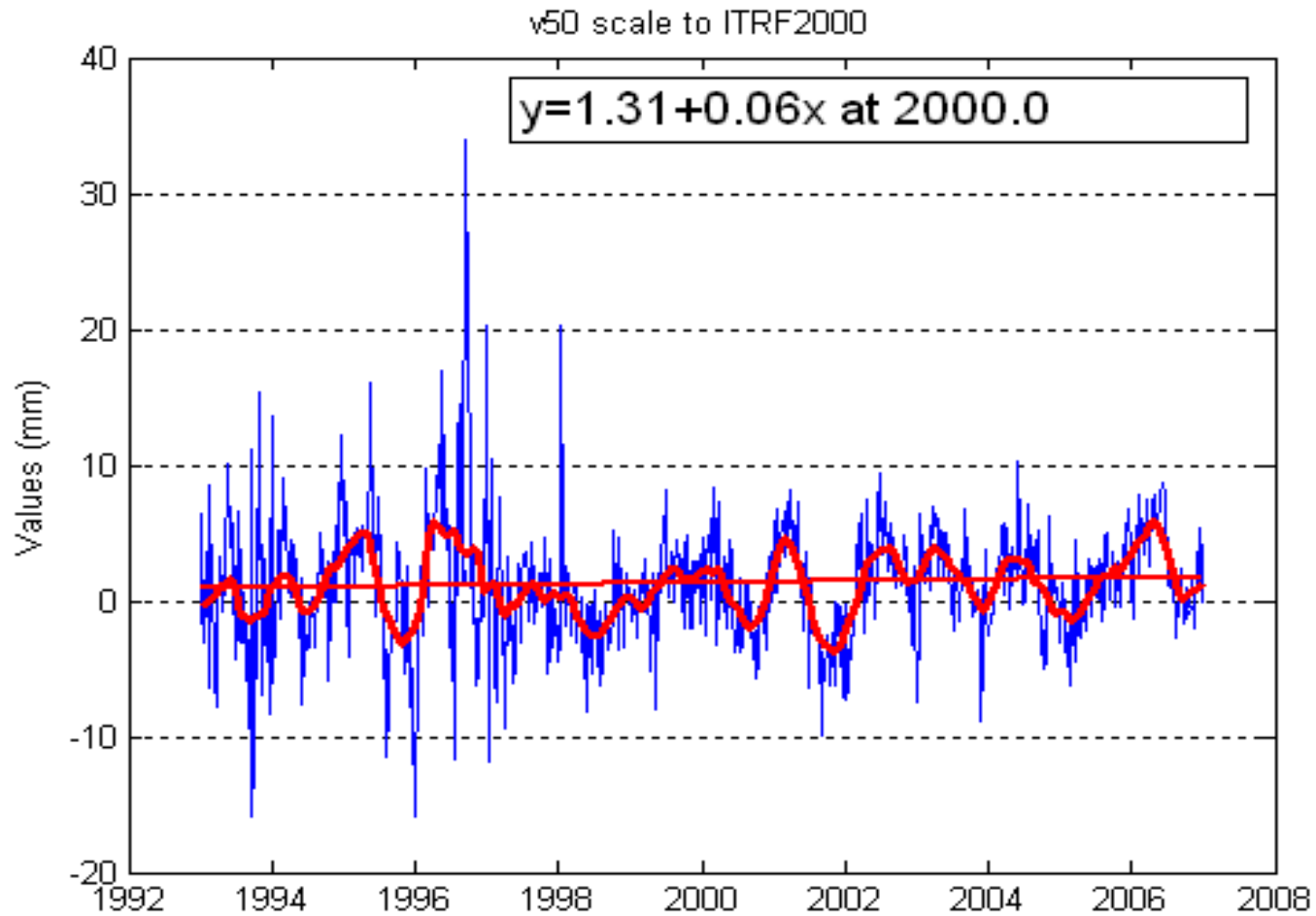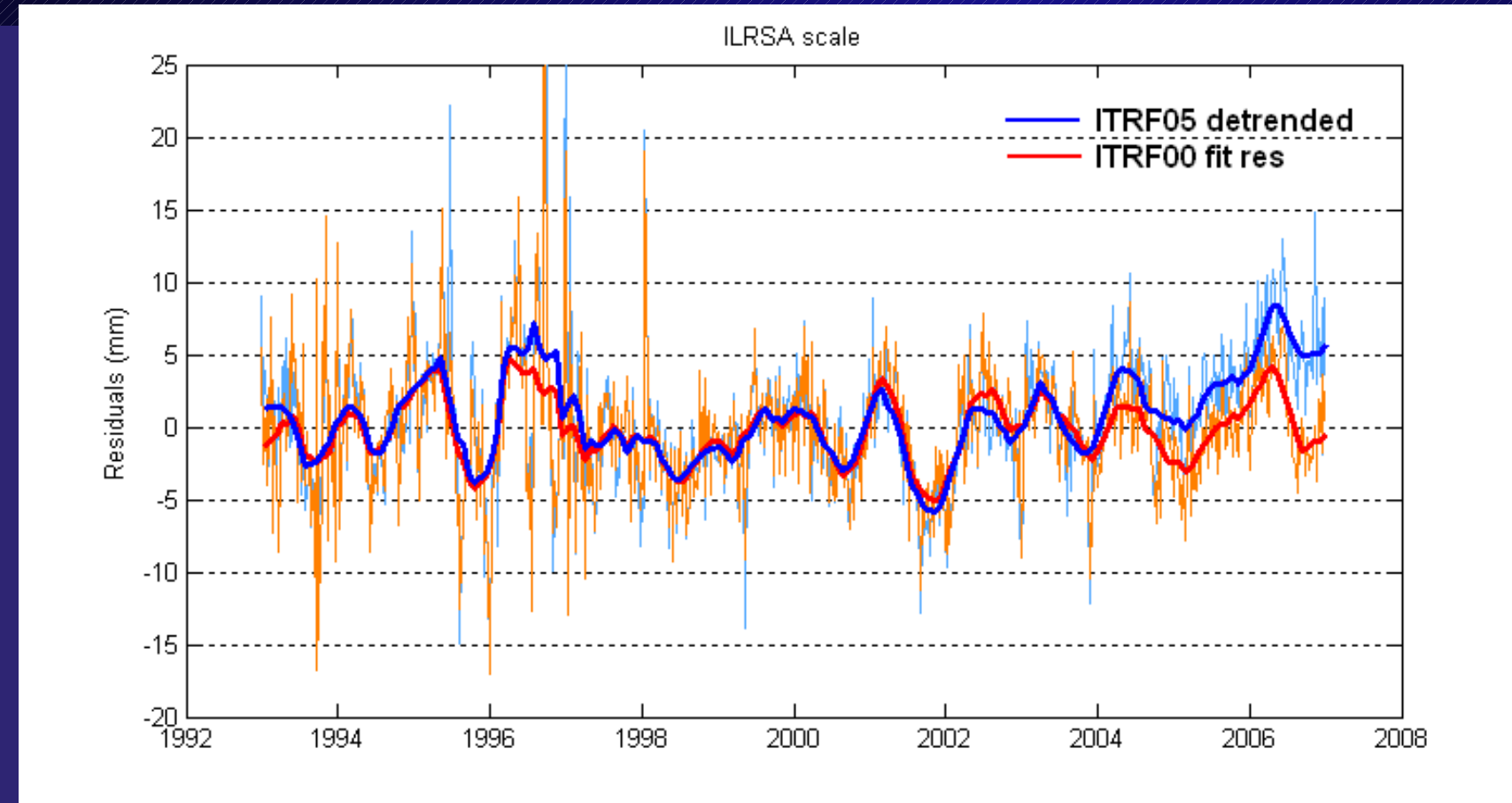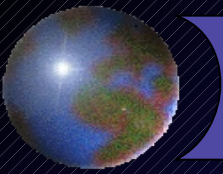
The ILRSA scale to ITRF2005

ILRS-A scale to ITRF2005

y=6.82+0.66x at 2000.0

IERS estimates
1 ppb = 6.38 mm
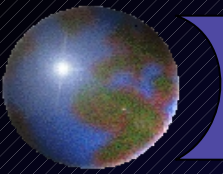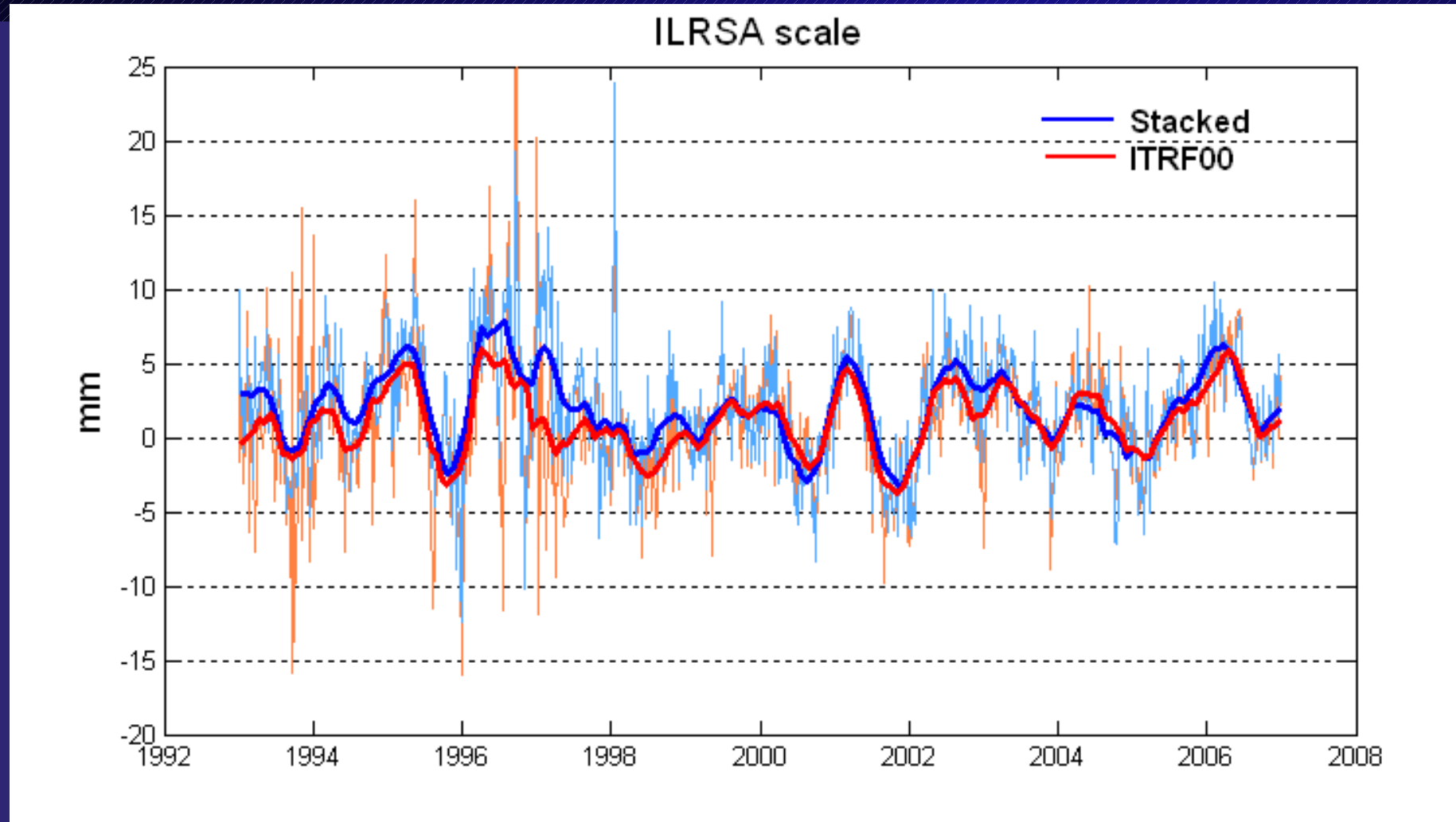**0.08 ppb/yr =0.51 mm/yr**
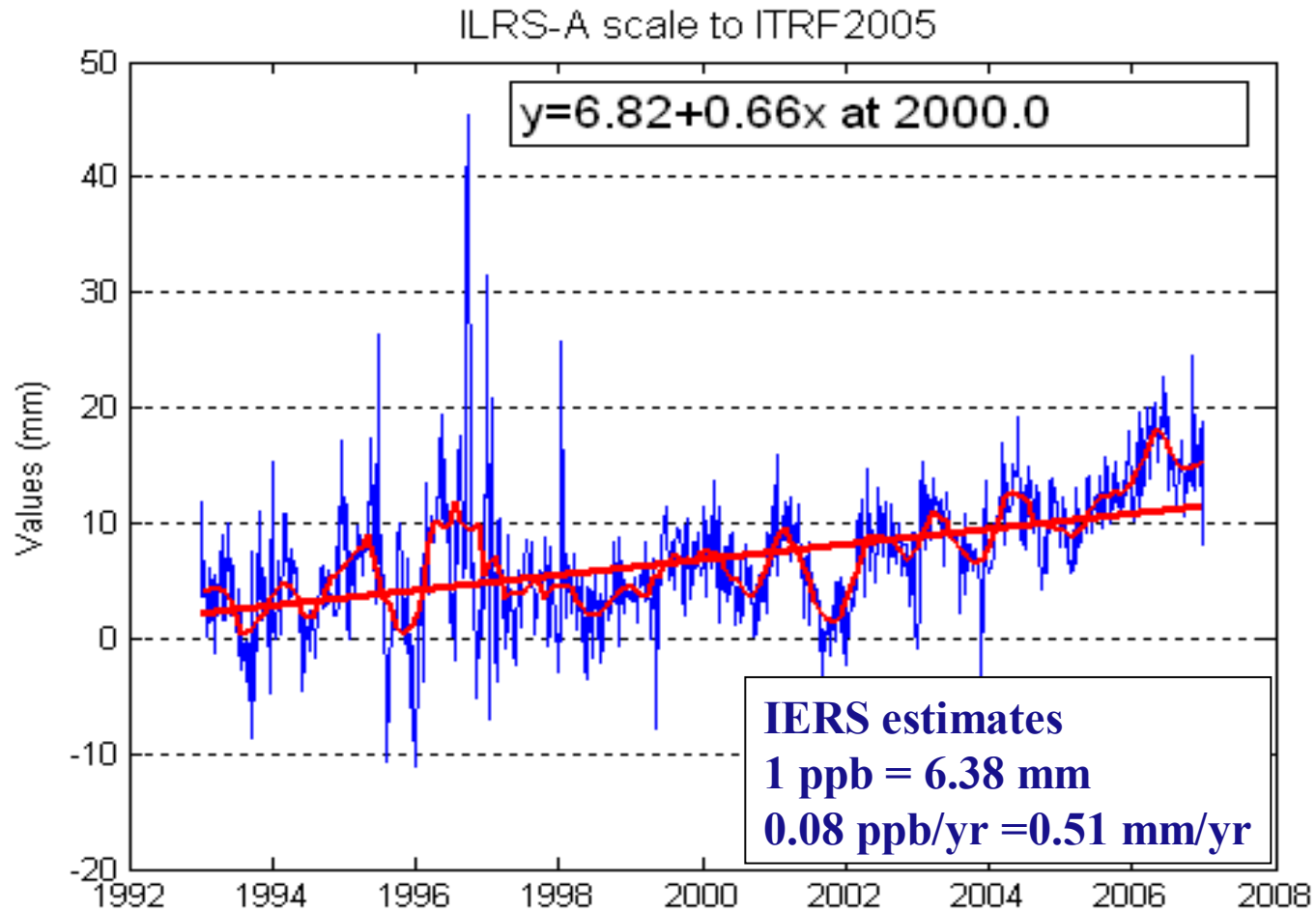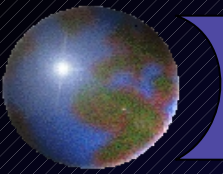
The ILRSA scale to ITRF2000

The ILRSA scale to ITRF
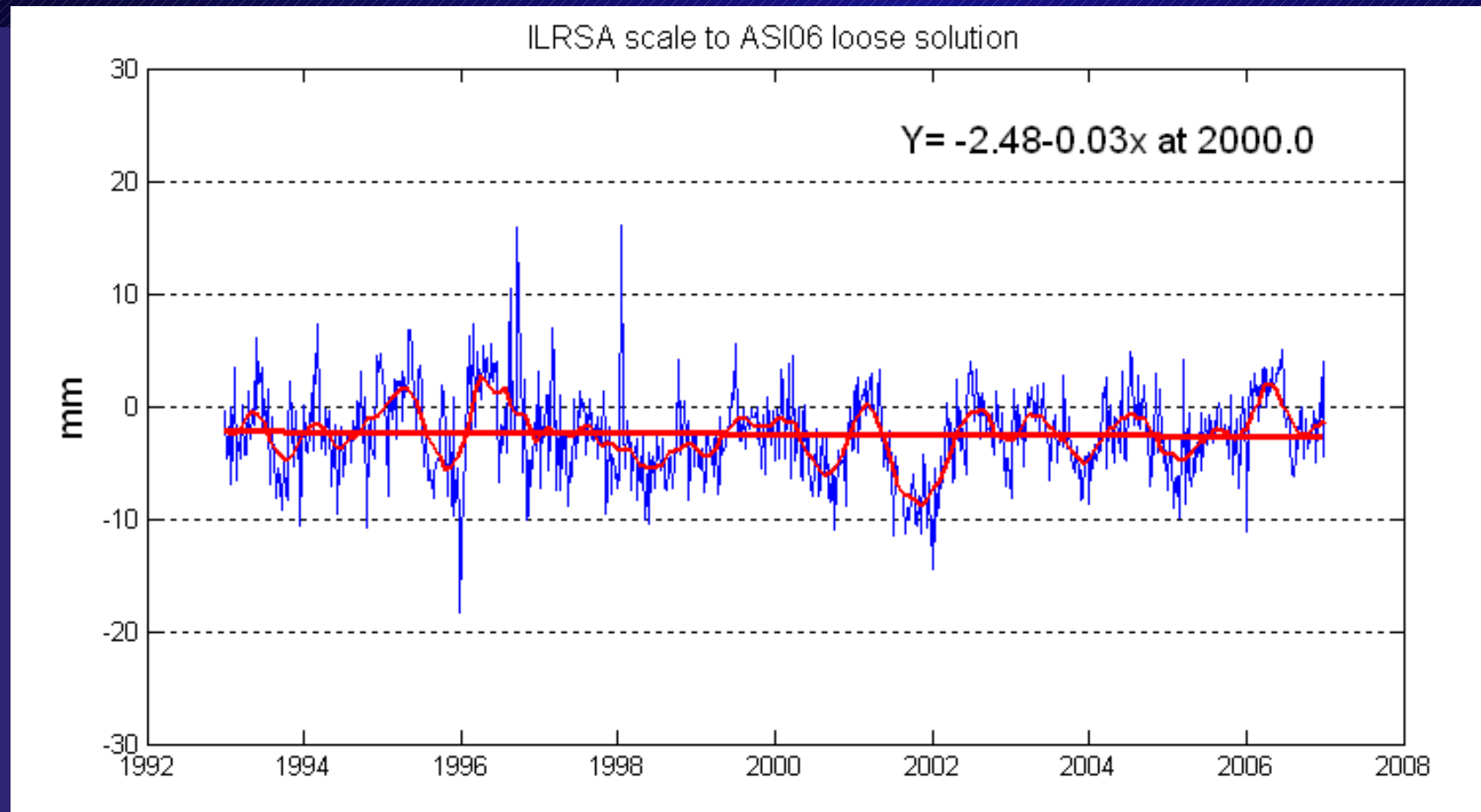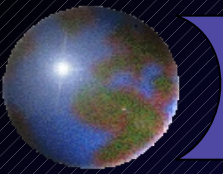

ILRSA scale

Detrended = 1 ppb and 0.08 ppb/yr removed
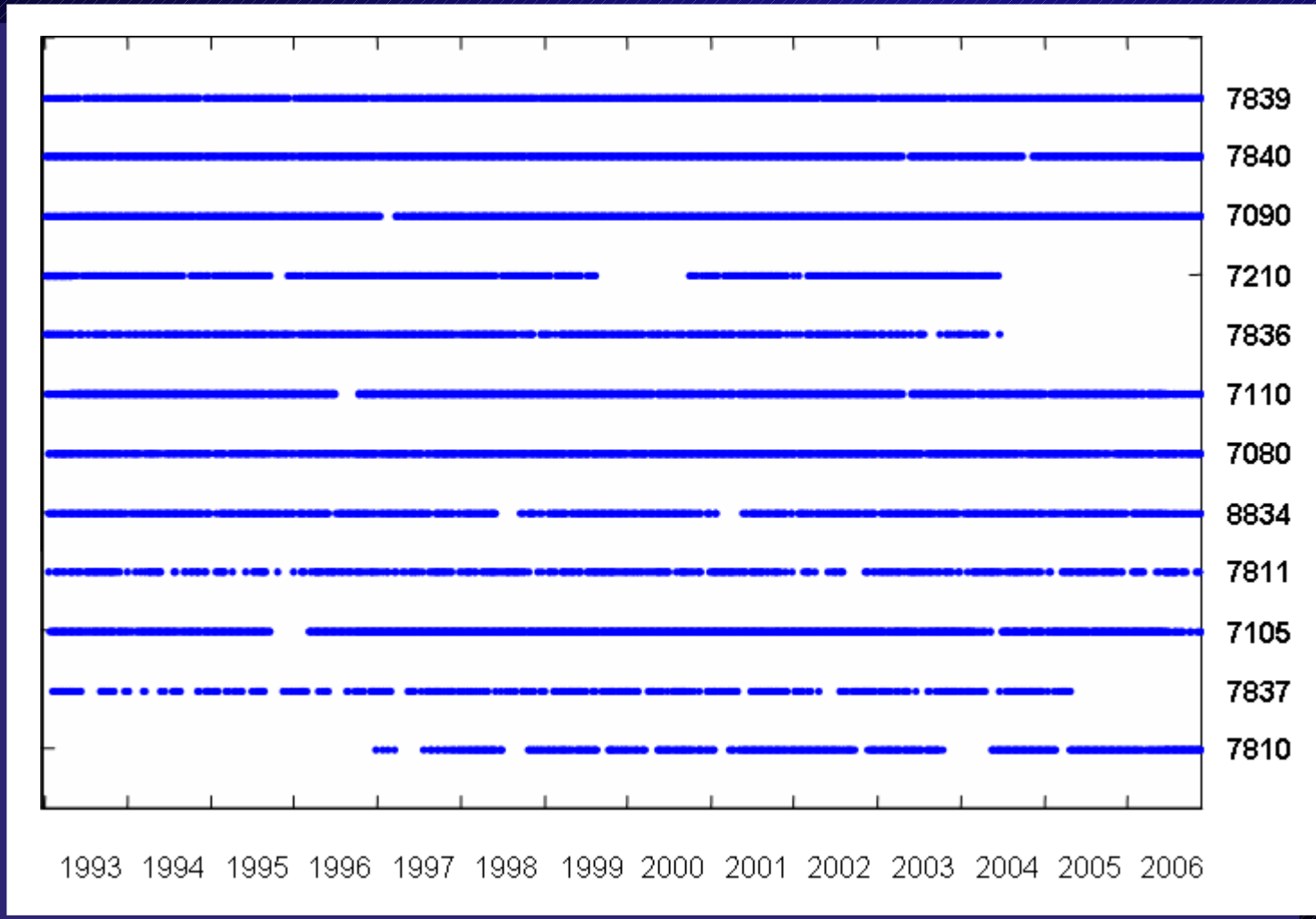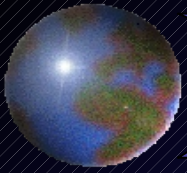
The ILRSA scale to a "stacked" SLR solution

The ILRSA scale to a global SLR solution (ASI06 loose)

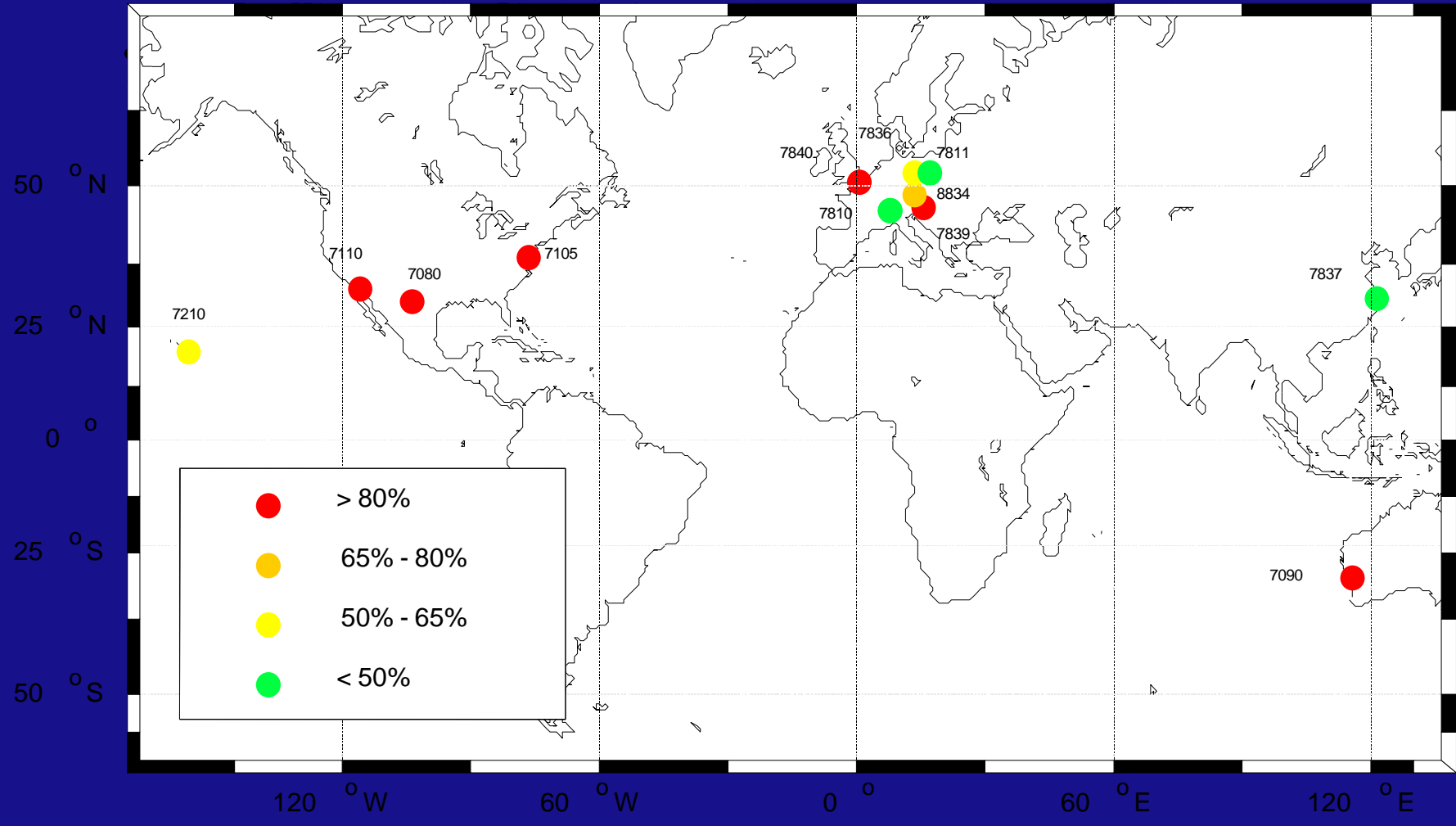# Core sites temporal coverage
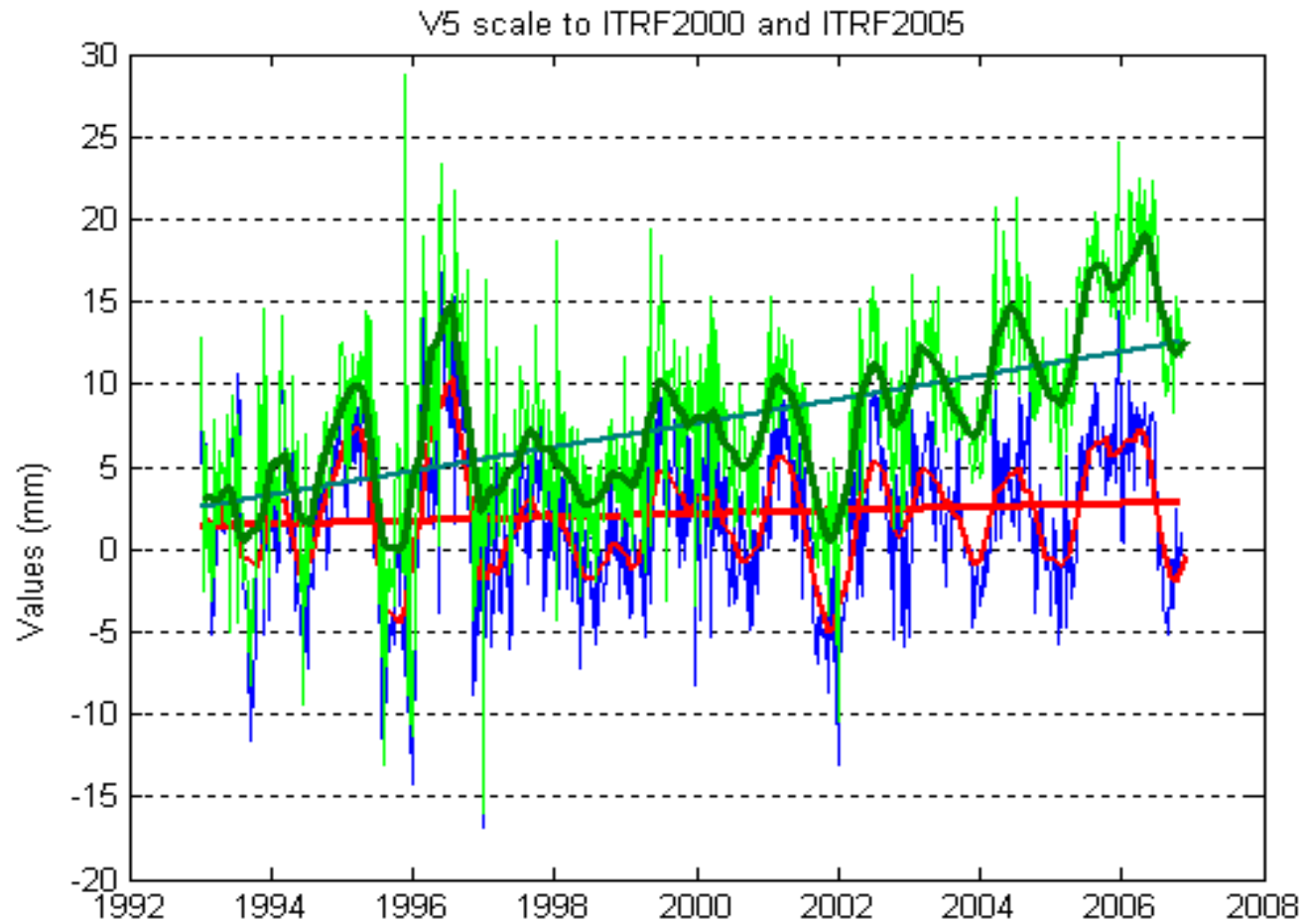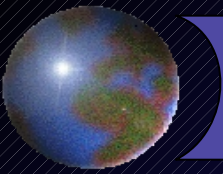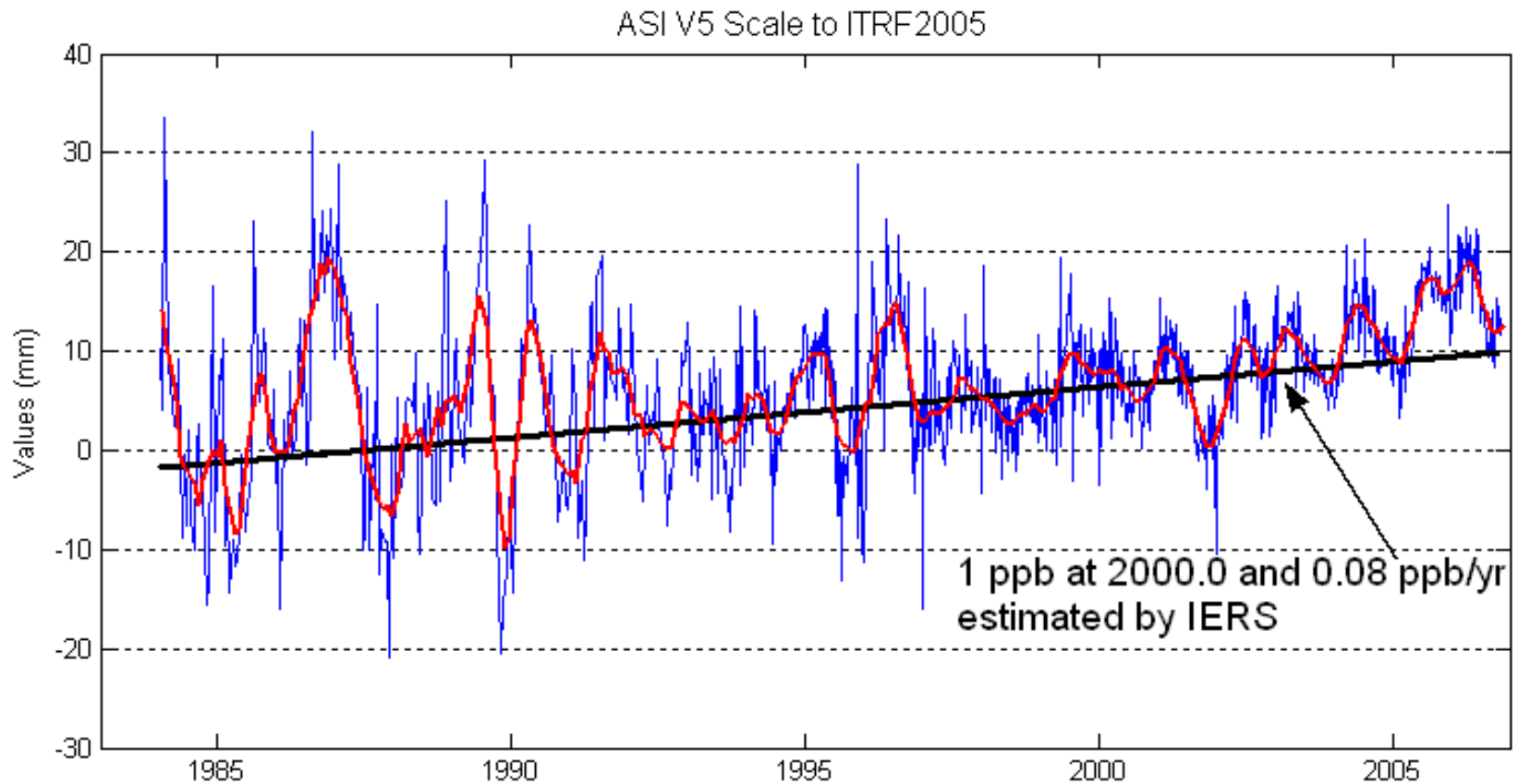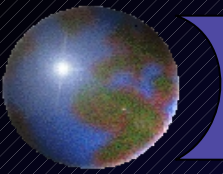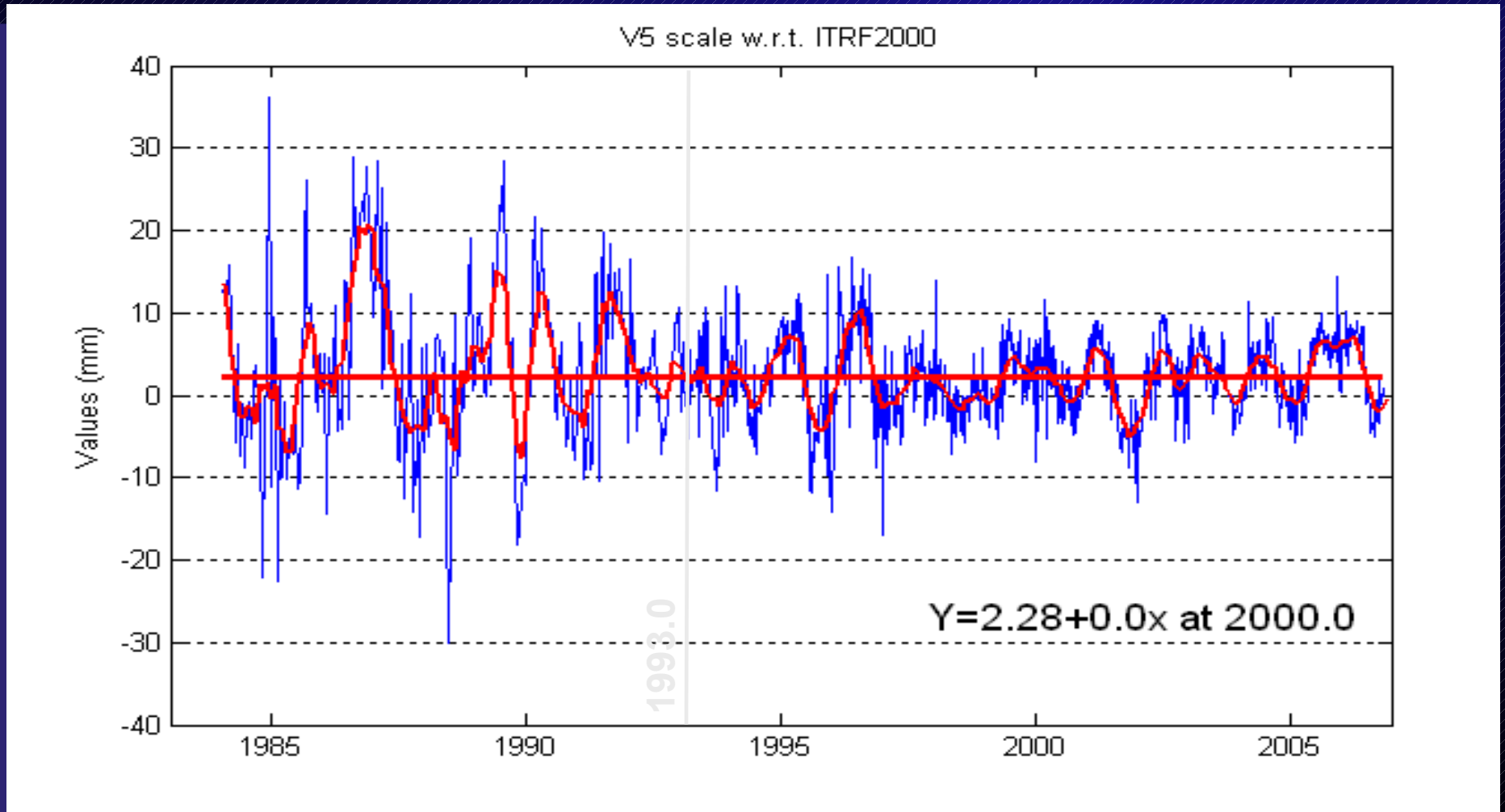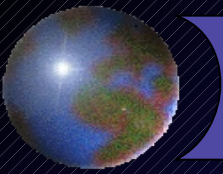
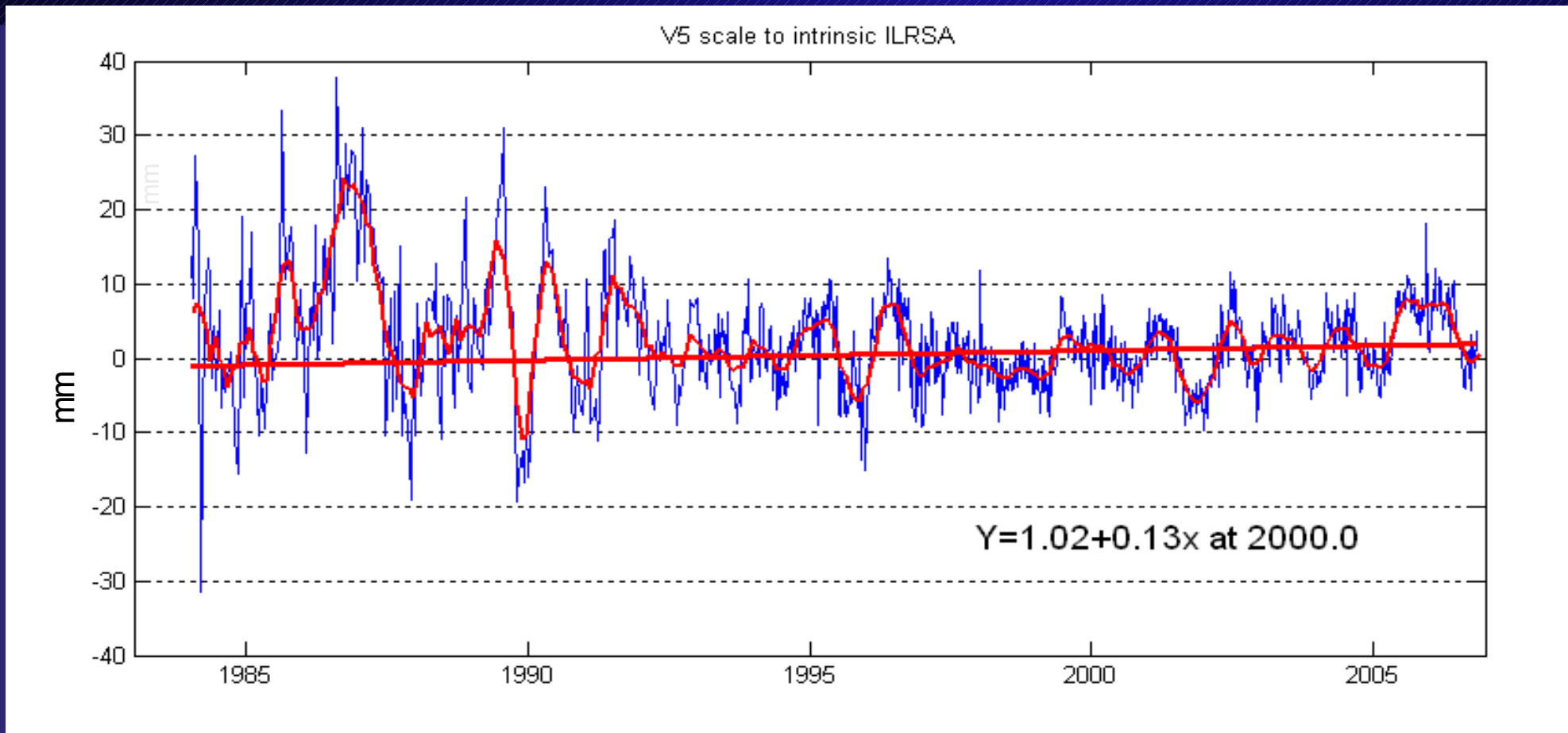# Core Sites
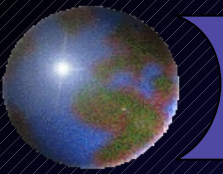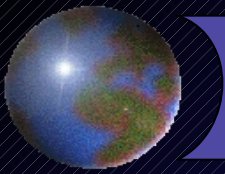
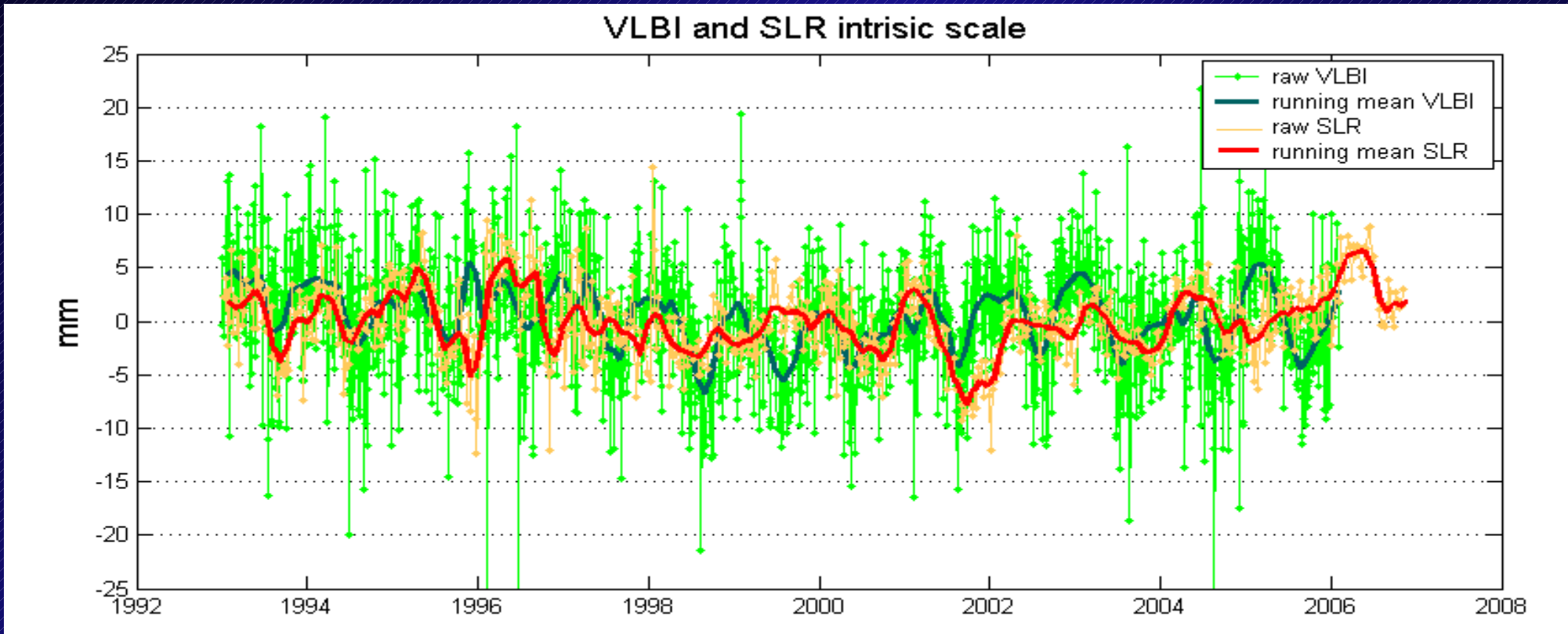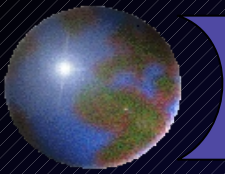# The ASI scale to ITRF

The ASI scale to ITRF2005

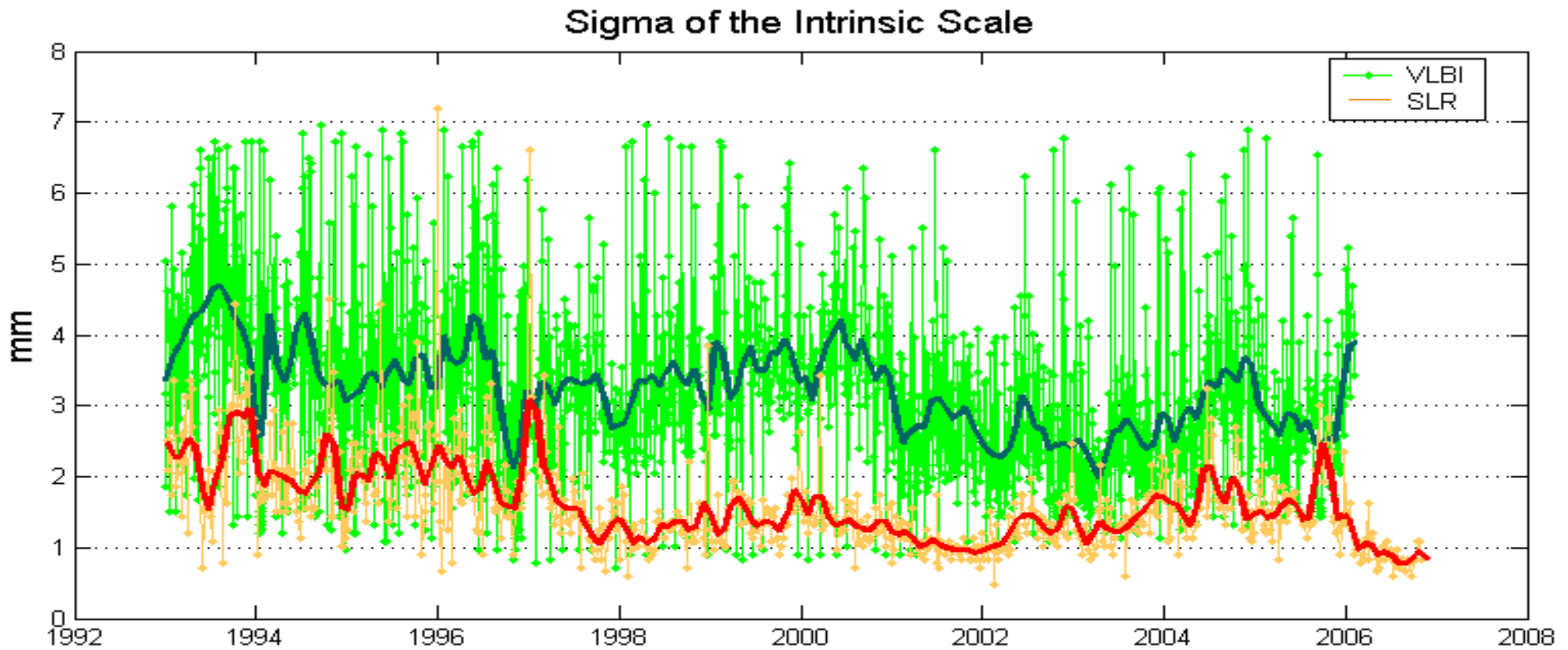# *The ASI scale to ITRF2000*
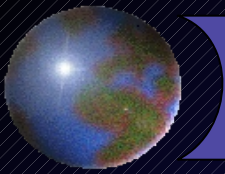
The ASI scale to a "stacked" SLR solution

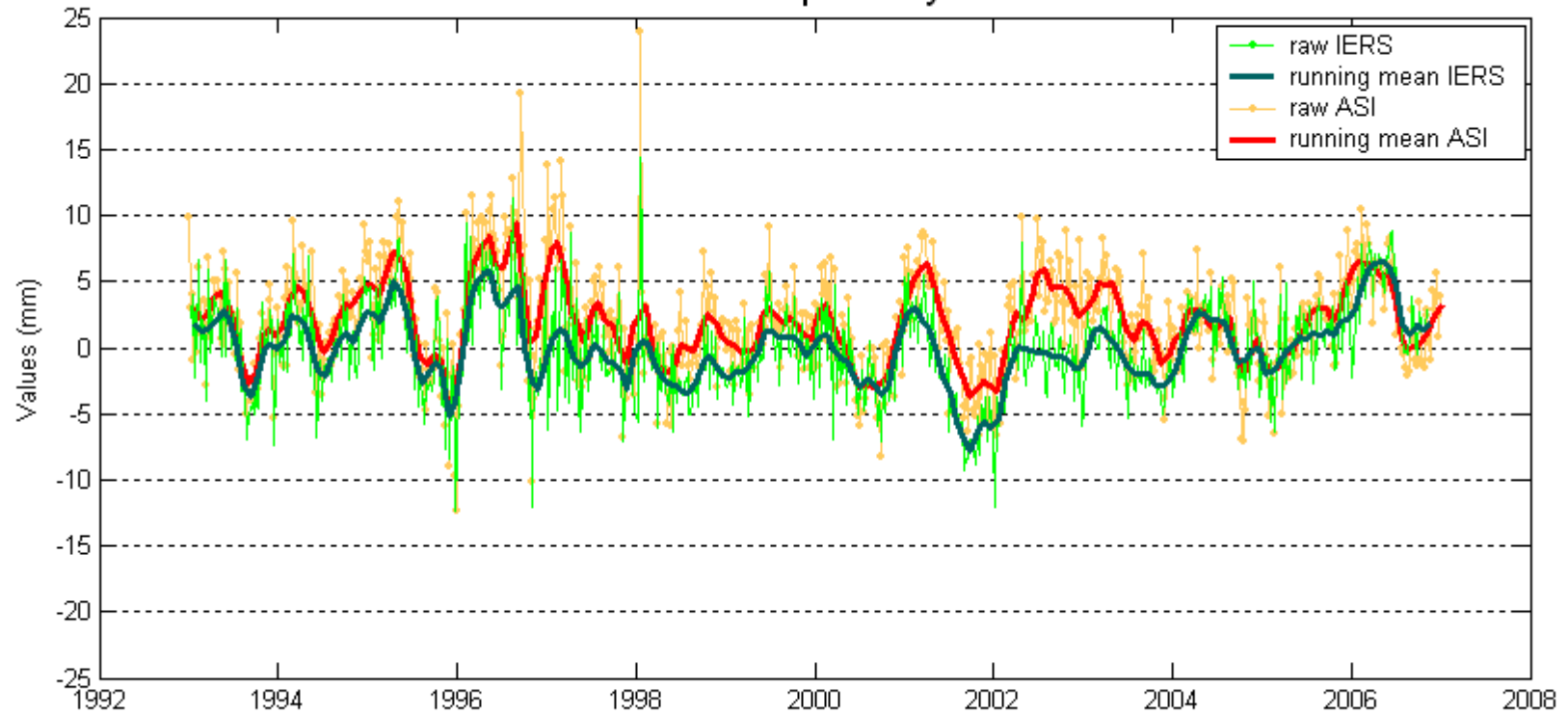# The SLR and VLBI scales as computed by IERS
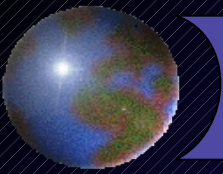
...and their sigmas

Sigma of the Intrinsic Scale

SLR intrisic scale computed by ASI and IERS

Global solutions scales to ITRF

SLR ITRF00 scale to ITRF05
3.70 mm at 1997.0 & 0.24 mm/yr
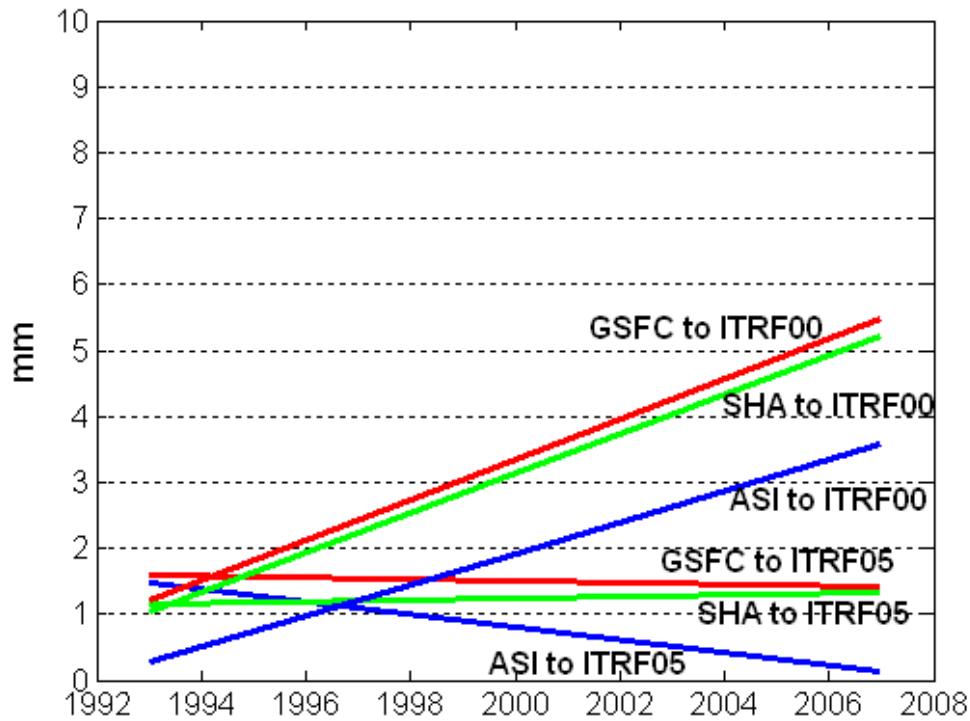
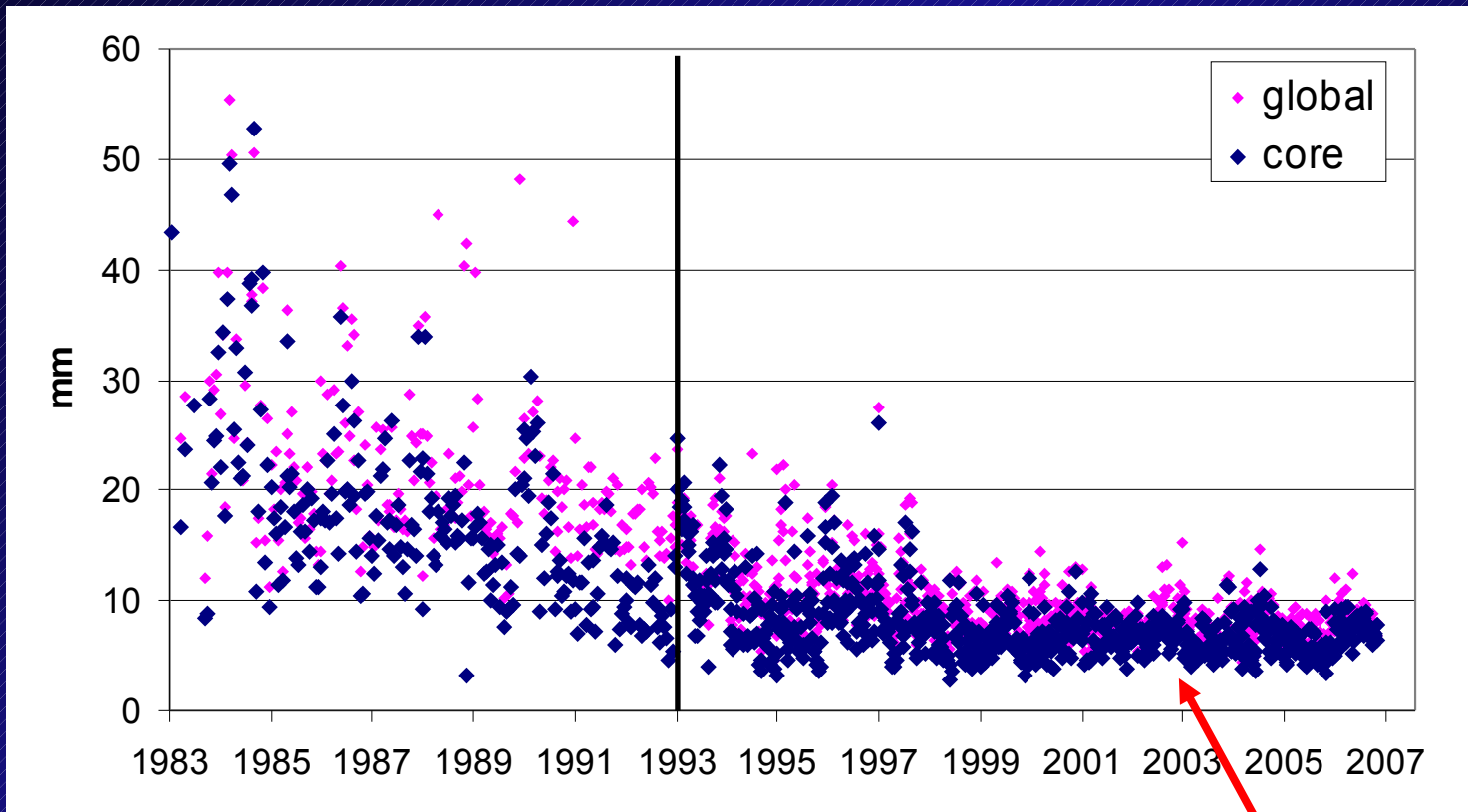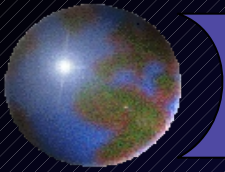VLBI ITRF00 scale to ITRF05
-1.28 mm at 1997.0 & -0.27 mm/yr
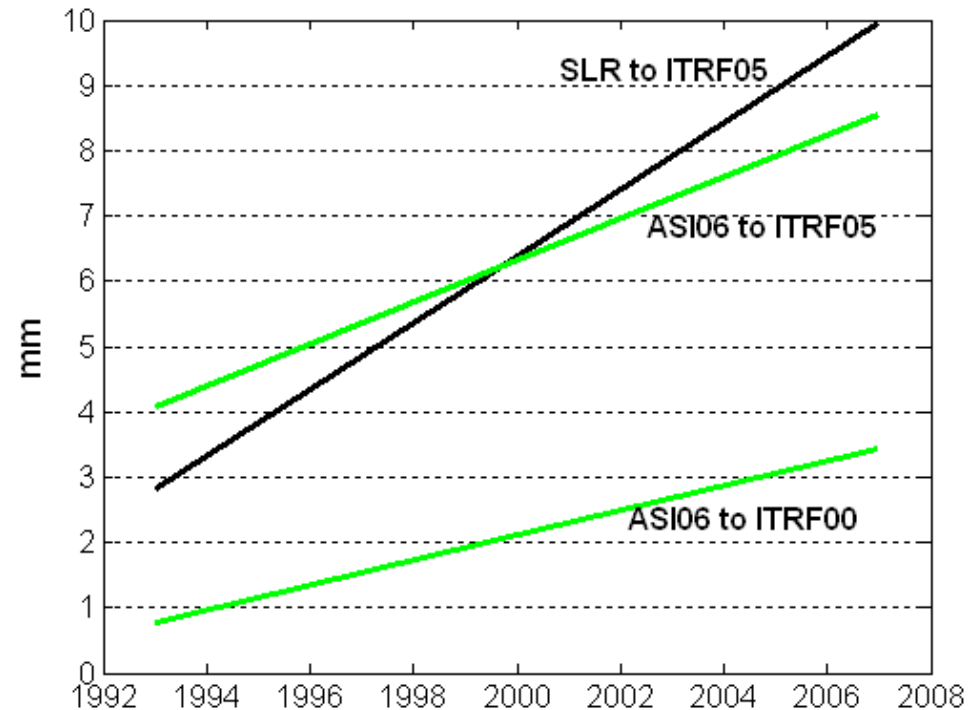
3-D coordinate residual WRMS w.r.t. ITRF2005 (ASI06 solution)

Remarks

- SLR scale from different solutions (global, "stacked", time series) are consistent
- No SLR intrinsic network effects (i.e. drift change) on the scale
- Scale difference is still an open problem. Ongoing investigations:
  - eccentricity vectors at collocated sites; ad hoc ILRS WG already established
  - SLR dataset; process started within the ILRS/AWG