Preparation of the IDS combination for ITRF2008

JJ. Valette

(with the contribution of F. Lemoine, P. Willis, Z. Altamimi, L. Soudarin, P. Ferrage in establishing the strategy)
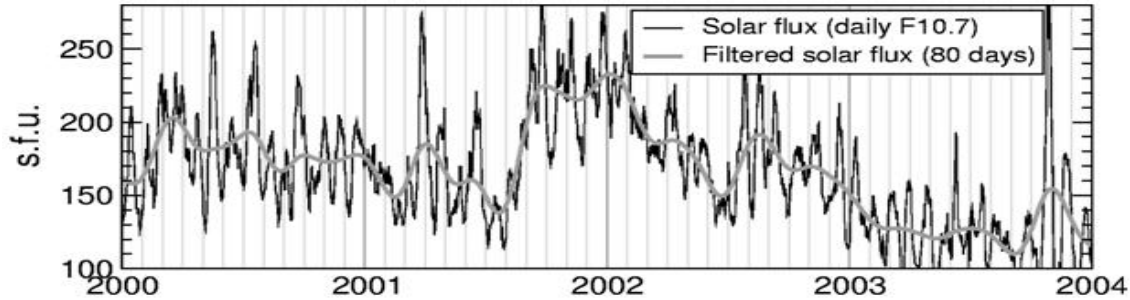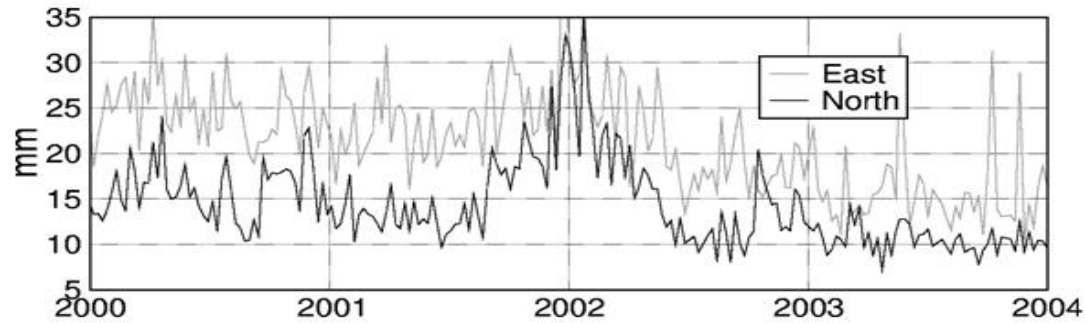
IDS combination for ITRF2008: 3 main steps

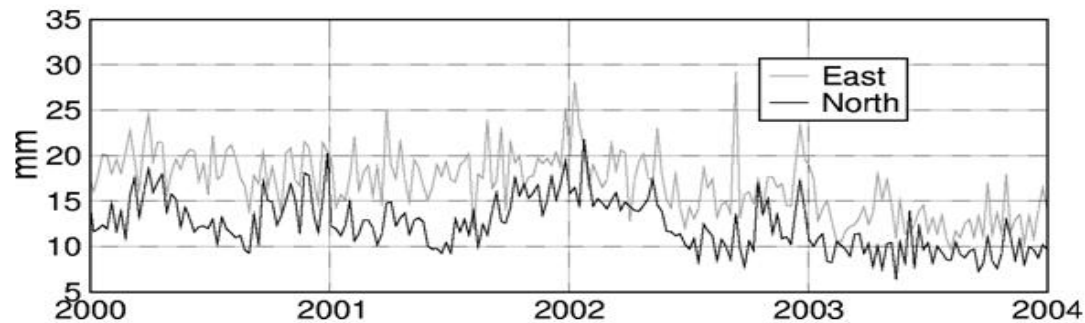| Iterations	Sinex Series & changes	Combination Strategy			Ref. System Problem
		Parameters	**Weigths**	**EOPs**	
IDS-1 (Fev. 09)	gopwd31 (1998.0-2008.0) inawd06 (1997.0-2008.8) lcawd20 (1993.0-2008.8) ignwd08 (1993.0-2008.8) gauwd06 (2003.0-2008.8) esawd03 (1993-2008.0) gscwd06 (2003.0-2008.8)	Geocenter : IC[3] for all series Scale: GAU, GSC estimated, IC for others	var. factor no deweight	no	Scale offset (gau & gsc) high residuals : 2002 solar activity
IDS-2 (May. 09)	Same as above except : gopwd31 : 1993.0-2008.0 lcawd21 : 1h Cd[1] (2002) gauwd08 : new tropo, 2h Cd[1] ,2002.0-2003.0 gscwd10 : new tropo +2h Cd[1] , 1992.8-2003.0	Geocenter : INA, LCA estimated IC for other series Scale : IC for others	deweight: INA : 4 LCA : 2	no	Periodic signals TZ: 118 & 365 days Scale : 365 days
IDS-3 (Aug., 09)	Same as above except: lcawd24 : SRP[2] fixed	Geocenter and Scale: GAU, INA, LCA estimated IC for ESA, GOP, GSC,IGN (validation step for all series with 5 cm residual threshold)	var. factor no deweight	yes	-
Cd[1] **Satellite drag coefficient estimated per 2 hours or higher during Sept.2001-March2002** SRP[2] **Solar Radiation Pressure fixed to avoid TZ periodic signals at 118 days and 1 year** IC[3] **Internal Constraints**					

(16 yrs)

Solar activity in 2002

a) solar flux
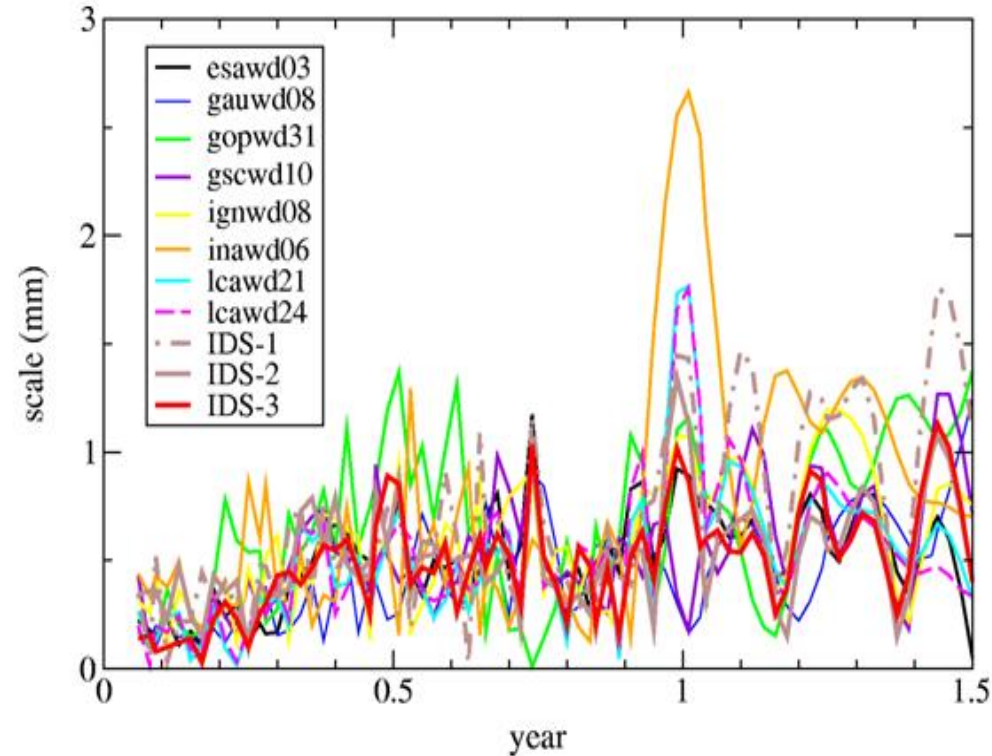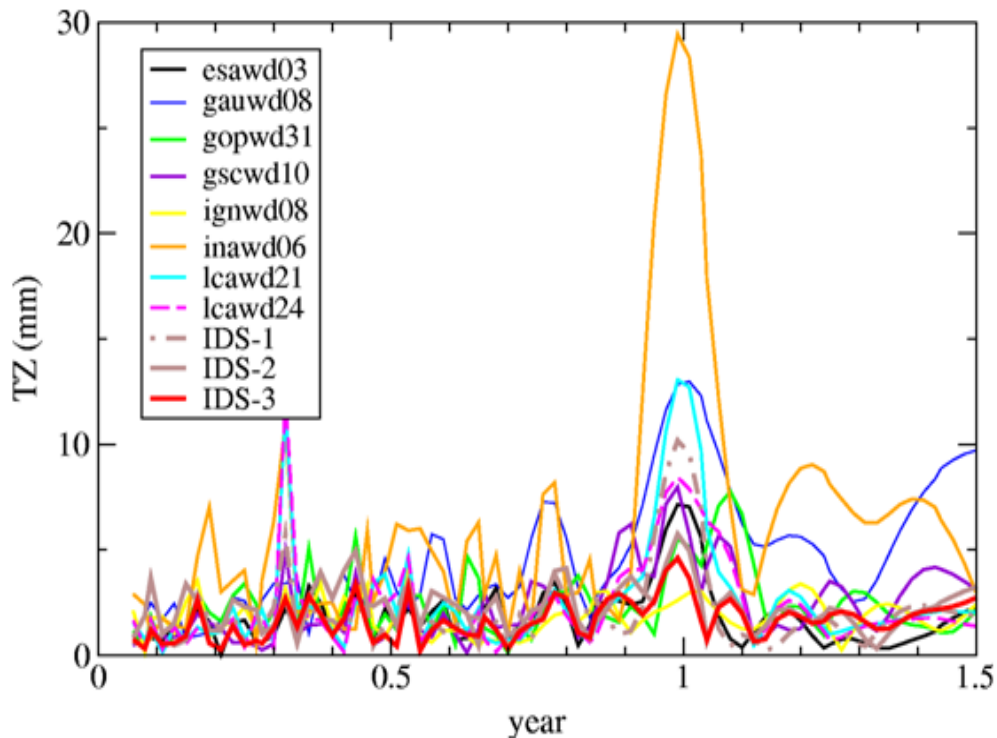

b) IDS-1 horizontal residuals

IDS-1 (horiz. Residuals)

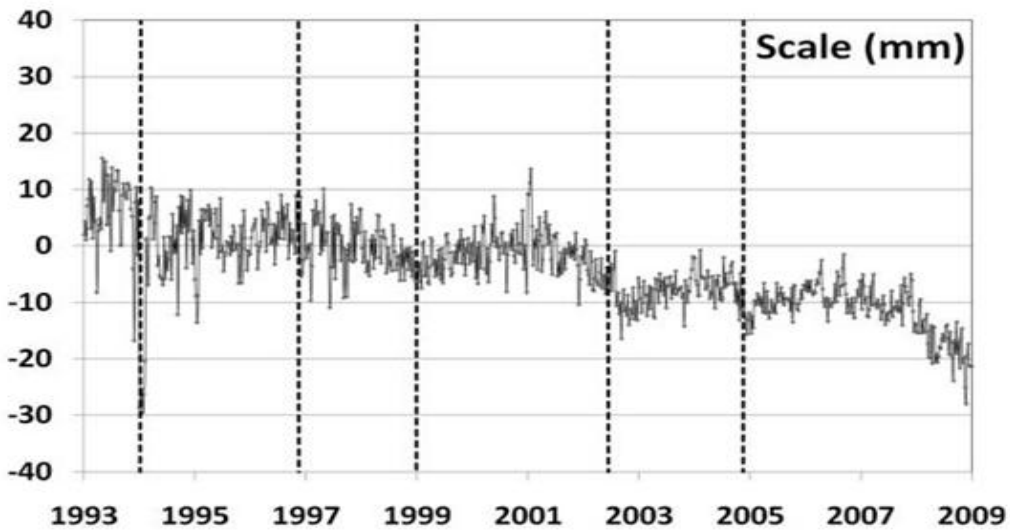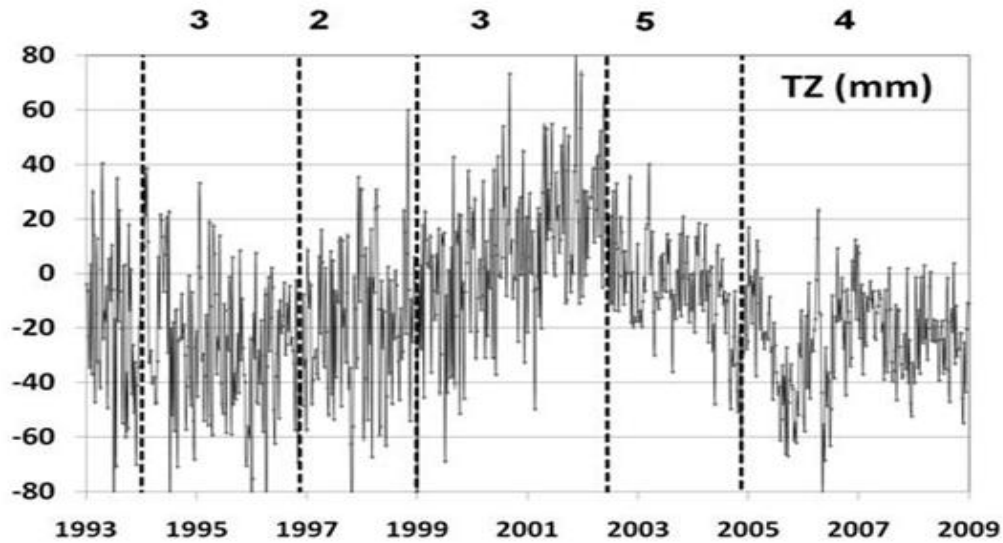c) IDS-3 horizontal residuals

IDS-3 (horiz. Residuals)
1-2 hrs Cd

Periodic signals (TZ & scale)

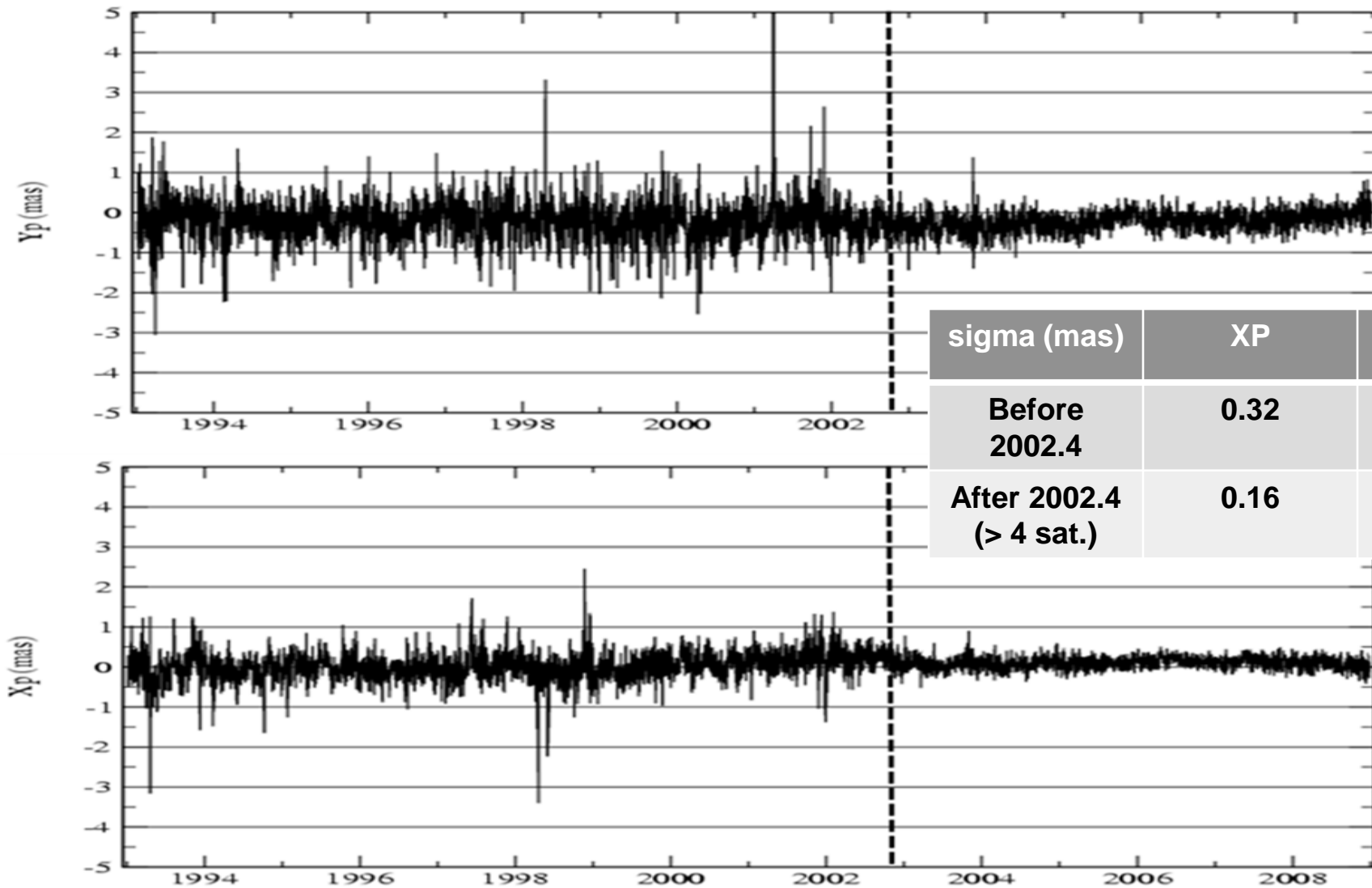*118 days period for TOPEX/POSEIDON*
365 days period for Envisat & SPOTs
➢ *SRP mismodelling (Gobinddass et al. 2009)*

IDS-3 : DORIS system periods & events

IDS-3 EOPs (wrt IERS 05 C04)

sigma (mas)	XP	YP
Before 2002.4	0.32	0.43
After 2002.4 (> 4 sat.)	0.16	0.26

General comments

- **Principle of the combination: to find the best strategy keeping all of the 7 ACs contribution**

  ➢ A high motivation and active cooperation of the analysts (iterative process with model refinements and heavy reprocessing)
  ➢ A « good » IDS final solution (with a 16 year data set)

Solution	Ref. Epoch	RMS-Position (mm)			RMS-Velocity (mm/year)		
		East	North	Up	East	North	Up
IDS-3	2000.0	7.7	6.1	10.3	1.8	1.2	1.6

Cumulative IDS-3 solution wrt ITRF2005

To be explored

- **Scale behaviour (satellite constellation, system events…?)**

- **Drag modelling at solar max (Spots & Envisat) & TZ impact?**

- **EOPs (per AC)**

- **Troposphere (latest mapping function)**

- **New missions : Jason-2 and Cryosat**