

DORIS status

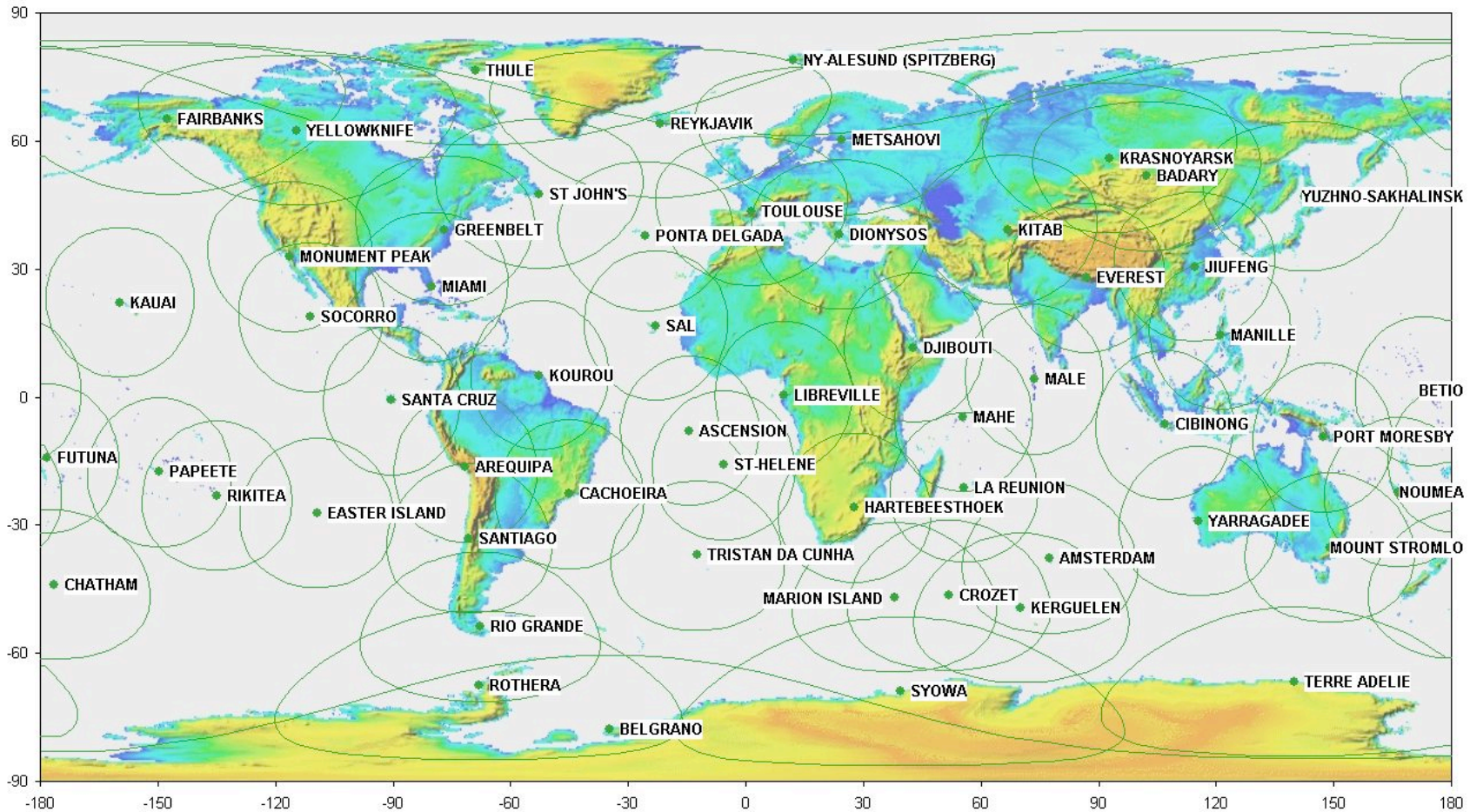
F. Lemoine (NASA/GSFC)

Network

- **March 2008: Equipment upgrade at Santiago**
- **February 2008: Equipment upgrade at Everest**
- **February 2008: Antenna raising at Terre Adelie (Antarctica)**
- **January 2008: Equipment upgrade at Syowa (Antarctica)**
- **December 2007: Antenna raising at Monument Peak (California, USA)**
- **November 2007: Antenna change and raising at Rothera**
- **October 2007: Equipment upgrade at Papeete (French Polynesia)**
- **July 2007: Antenna change at Toulouse (France)**
- **May 2007: Antenna change and raising at Yellowknife**
- **April 2007: Antenna raising at Amsterdam**
- **April 2007: Antenna change and raising at Kerguelen**
- **April 2007: Antenna raising at Crozet**

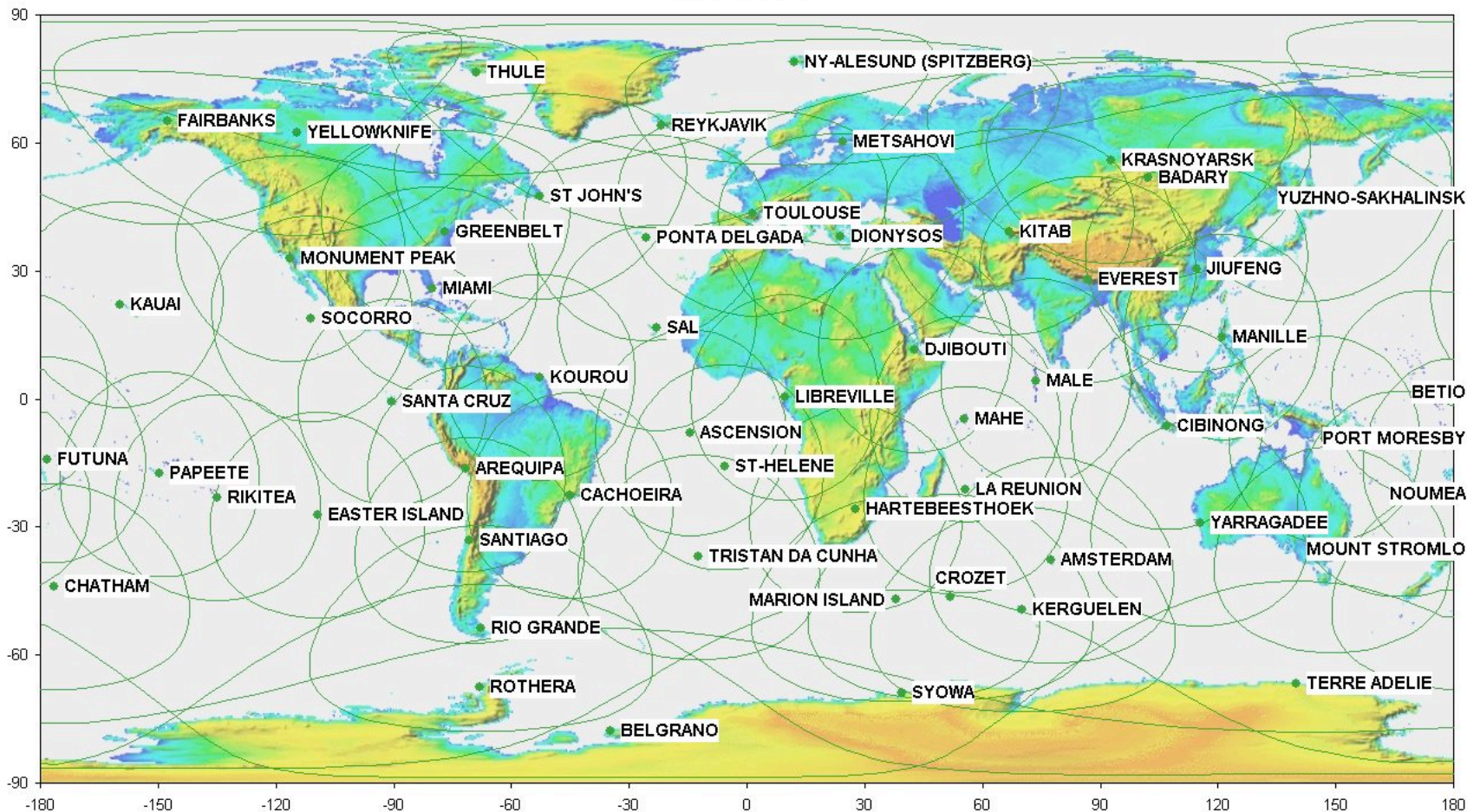
Network

ENVISAT-1 DORIS stations visibilities
Elevation 12°



Network

Jason-1 DORIS stations visibilities
Elevation 12°



Jason-2 mission summary

Science Measurements

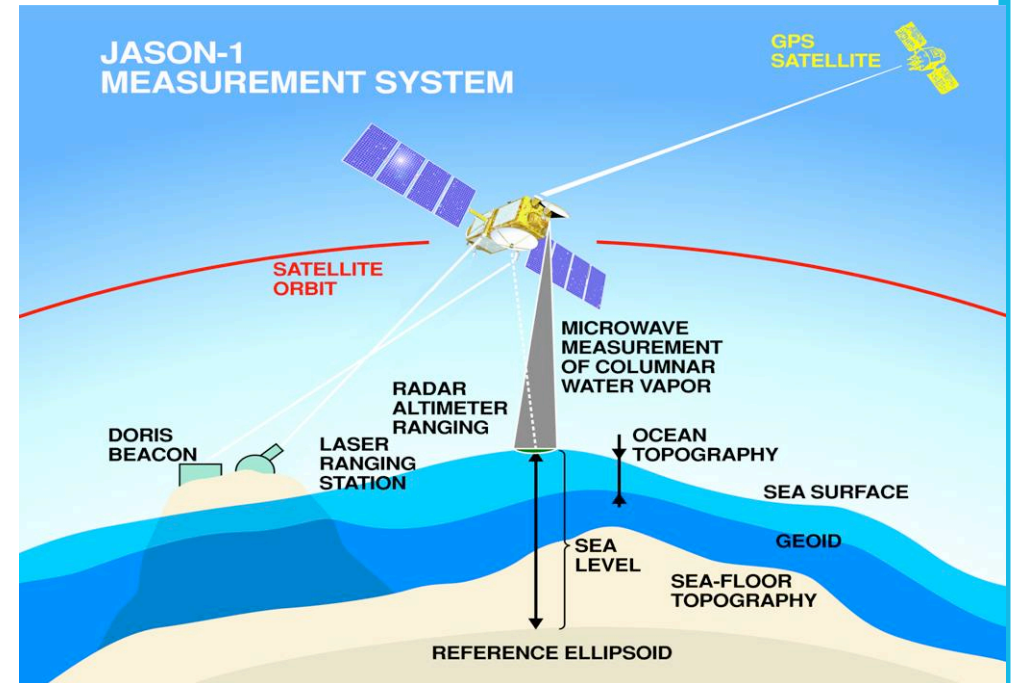
Global sea surface height to an accuracy of ≤ 4 cm every 10 days, for determining ocean circulation, climate change and sea level rise

Mission Objectives

- Provide continuity of high precision ocean topography measurements beyond TOPEX/Poseidon and Jason-1
- Provide a bridge to an operational mission to enable the continuation of multi-decadal ocean topography measurements

Instruments

- Core Mission:
 - Poseidon-3 Altimeter
 - DORIS (Precise Orbit Determination System)
 - Advanced Microwave Radiometer (AMR)
 - GPS Payload (GPSP)
 - Laser Retro-reflector Array (LRA)
- Passengers:
 - T2L2
 - JRE (Carmen2 + LPT)



Mission Overview

- Launch Date: 15 June 2008
- Launch Vehicle: Delta II 7320
- Proteus Spacecraft Bus provided by CNES
- Mission life of 3 years (goal of 5 years)
- 1336 km Orbit, 66° Inclination

Jason-2 status

- ➔ All payload instruments delivered
- ➔ Payload instruments integration and test: completed (Dec '06 to June '07)
- ➔ Current measured payload and satellite performance meets all requirements
- ➔ **Satellite Assembly, Integration and Test: from June '07 to February '08**
 - Initial performance tests, mechanical tests, radiated EMC and conducted EMC tests performed
 - Thermal Vacuum, Mission Profile performed
- ➔ **Next main milestones:**
 - Satellite Qualification Review : beginning March 08
 - Operation Readiness Review : April 08
- ➔ **Launch: mid June 2008**
 - ~ 1 month schedule margin for satellite



DORIS Data delivery schedule

- **Launch: June 15, 2008**
- **Start of cycle 1: 5 to 6 weeks**
- **Flight acceptance: 2 months**
- **DORIS Data delivery**
 - **RINEX**
 - ◆ Daily files
 - **POD 1b (DORIS Data Exchange Format Version 2.2)**
 - ◆ 10-day files

Future Missions

- ➔ **CryoSat (ESA)**
 - May 2009

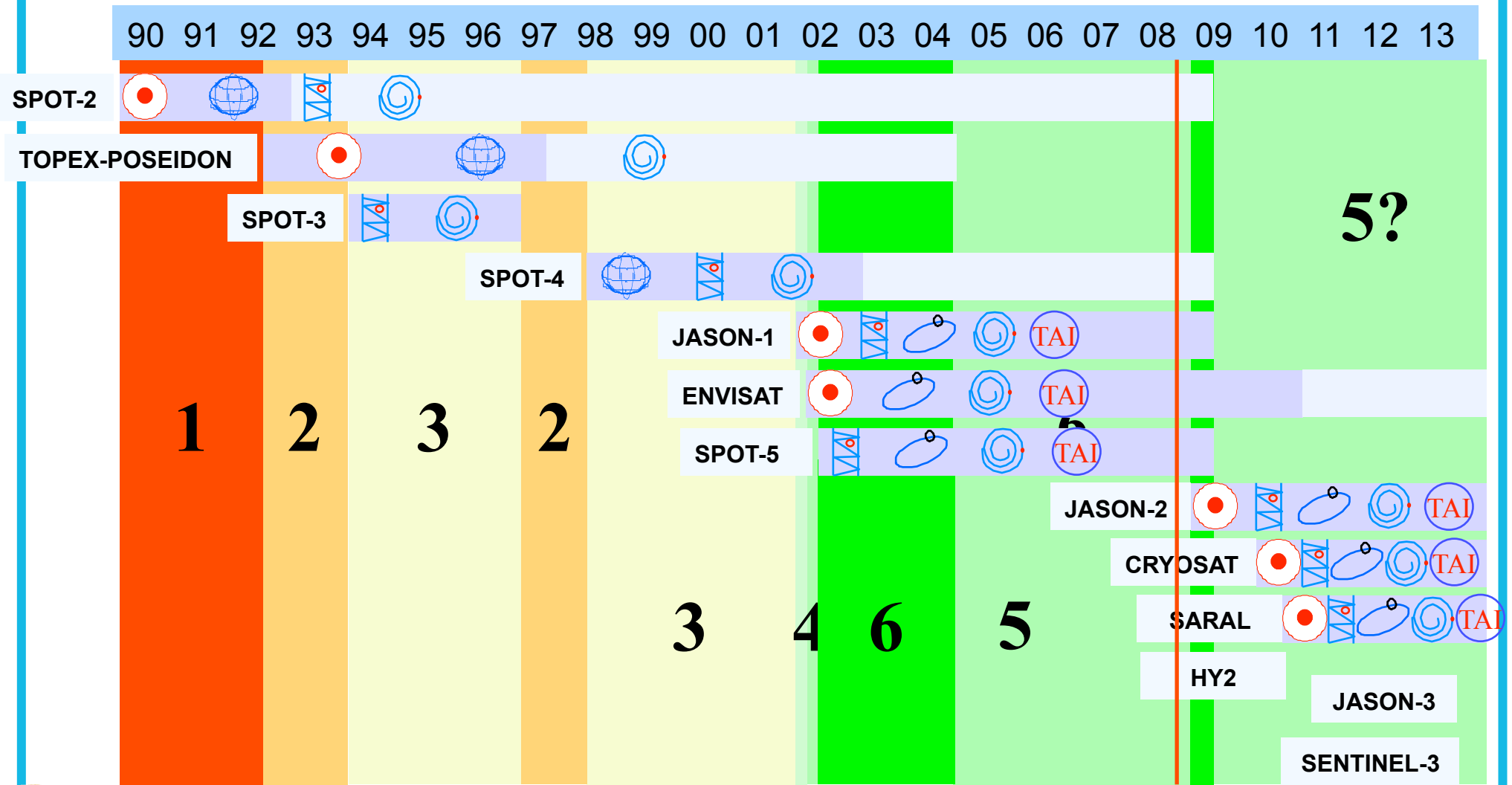
- ➔ **SARAL/Alti-KA (CNES/ISRO)**
 - 2010

- ➔ **Hy2 (CNSA/CNES)**
 - June 2010?

- ➔ **SENTINEL 3 (ESA)**
 - November 2012

- ➔ **Jason-3 (NOAA/EUMETSAT/CNES/NASA)**
 - End 2012?

IDS tomorrow: Satellites



Possible Missions

- ➔ **SEOSAT (SPAIN)**
 - 2011?

- ➔ **CEMIT (NASA Small Explorer program)**
 - Dallas and Colorado universities proposal: spatial environment (iono)
 - Possible CNES proposal for DORIS + accelerometers: thermosphere
 - Accelerometers beyond CHAMP and GRACE: 2012?

- ➔ **EarthCARE (ESA)**
 - DORIS + GPS - 2013? 3+ years

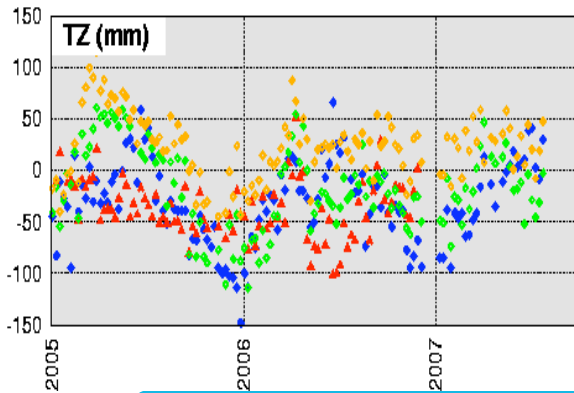
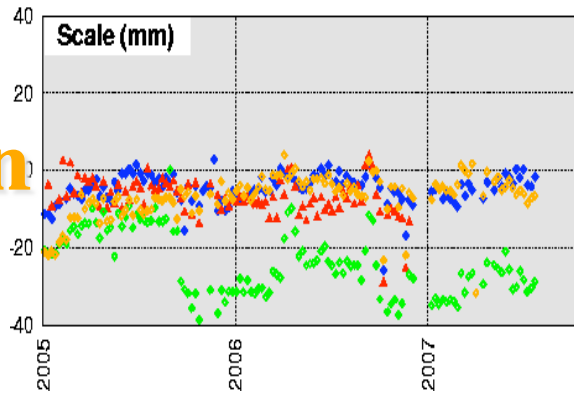
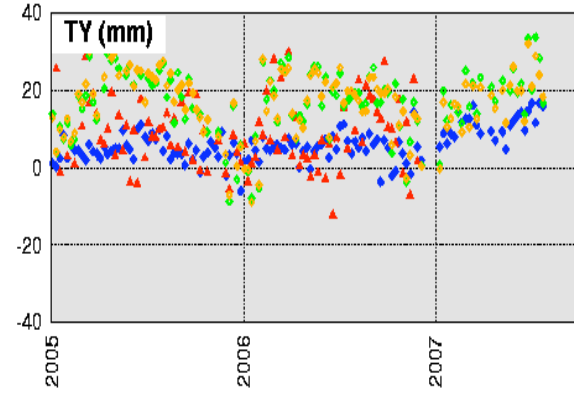
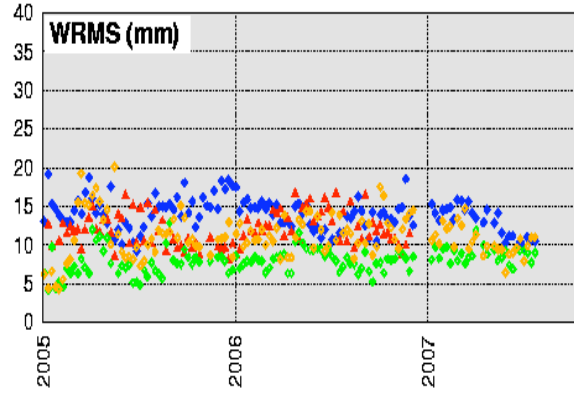
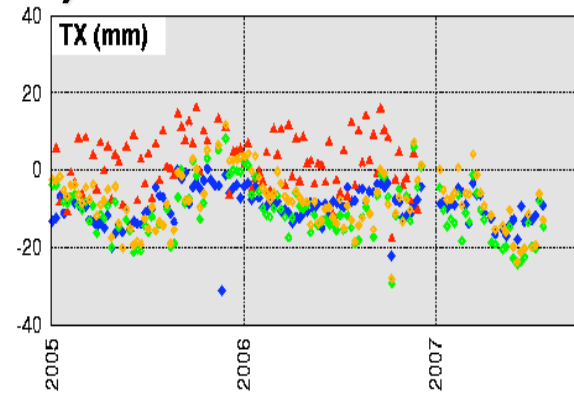
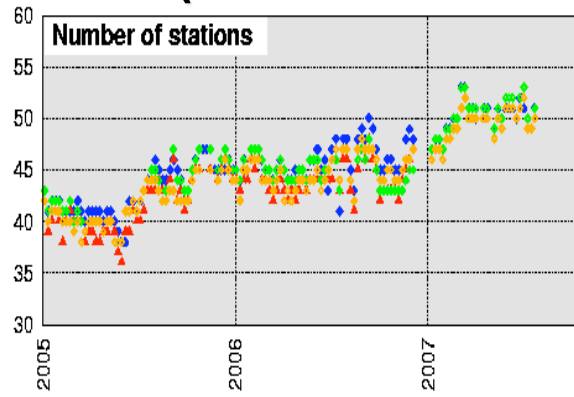
- ➔ **GRASP (Y. Bar Sever - JPL)**
 - On-board colocation (SLR + DORIS + GPS + VLBI)

(New IDS Center Analyses since ITRF2005)

AC	solution	software
IGN	ign (wd05)	GIPSY/OASIS
LEGOS/CLS	lca (wd18)	GINS/DYNAMO
INASAN	ina (wd03)	GIPSY/OASIS
PECNY	gop (wd03)	BERNESE
Geosc. Aus	aus (wd02)	GEODYN

1. Loosely constrained with var-cov and EOPs.
2. IGN, LCA & GOP processed the ENVISAT and SPOT (2,4,5) satellite data.
3. INA also processed the Jason-1 satellite data.
4. Geosc. Aus. processed SPOT(2,5), Jason-1 & ENVISAT.

TRF parameters (Geocenter & Scale)w.r.t. ITRF2005



lca

gop

ina

ign



ENVISAT: RMS

ENVISAT				
Orbit Set	Npts	RMS Orbit Differences (cm)		
		Radial	Cross-tr.	Along-tr.
ESOC vs IGN	299	1.5	3.2	5.4
IGN vs GSFC	295	1.7	4.2	6.3
IGN vs INA	294	1.3	4.8	11.6
INA vs GSFC	292	2.0	6.0	13.0
ESOC vs INA	292	1.6	4.5	12.6
ESOC vs GSFC	347	1.3	3.6	4.8
AUS vs GSFC	42	1.0	9.2	8.3
ESOC vs GOP	29	1.8	4.7	9.8
GOP vs GSFC	28	2.4	5.0	11.7
GOP vs IGN	30	2.1	4.7	11.8
IGN vs LCA	284	5.4	7.2	14.6
IGN vs LCA2	273	2.1	6.0	6.2
GSFC vs LCA	227	5.6	7.3	15.4
GSFC vs LCA2	103	2.3	7.4	6.1
INA vs LCA	274	5.8	7.1	14.7
ESOC vs LCA	732	5.5	6.5	15.3
ESOC vs LCA2	320	1.9	5.9	4.6

ENVISAT: Mean

ENVISAT				
Orbit Set	Npts	Average Orbit Differences (cm)		
		Radial	Cross-tr.	Along-tr.
ESOC vs IGN	299	0.1	-0.1	-0.6
IGN vs GSFC	295	-0.2	-0.8	-0.2
IGN vs INA	294	-0.5	-0.3	9.5
IGN vs LCA	284	-0.2	-1.0	8.1
IGN vs LCA2	273	-0.5	-2.3	-2.0
LCA vs GSFC	227	-0.4	-1.9	9.5
LCA2 vs GSFC	103	-0.7	-3.2	-1.5
INA vs LCA	274	0.3	-0.6	-2.2
ESOC vs LCA	732	-0.2	-0.9	9.6
ESOC vs LCA2	320	-0.5	-2.3	-1.2
INA vs GSFC	292	-0.7	-1.2	9.7
ESOC vs INA	292	0.6	0.2	-10.1
ESOC vs GSFC	347	-0.1	-0.9	-0.5
AUS vs GSFC	42	0	0	2.5
ESOC vs GOP	29	0.5	0.1	0.4
GOP vs GSFC	28	-0.7	-1.2	-1.1
GOP vs IGN	30	0.4	0.3	0.8

Per satellite RMS orbit differences average

Satellite	Radial (cm)	Cross-tr. (cm)	Along-tr. (cm)
ENVISAT (w. LCA2)	1.8	4.6	8.6
SPOT2	1.6	5.0	8.5
SPOT4	1.6	4.9	7.8
SPOT5	1.3	4.7	7.5