International Doris Service

IDS REPORT 2013

IERS Directing Board Meeting #57

San Francisco, California, USA

December 8, 2013

Outline

1. Satellite Constellation Status.
2. Network Status.
3. DORIS data and Data Center Status.
4. IDS Analysis Summary.
5. GB summary.
6. Future IDS meetings.

DORIS Constellation Status - Current Missions (5)

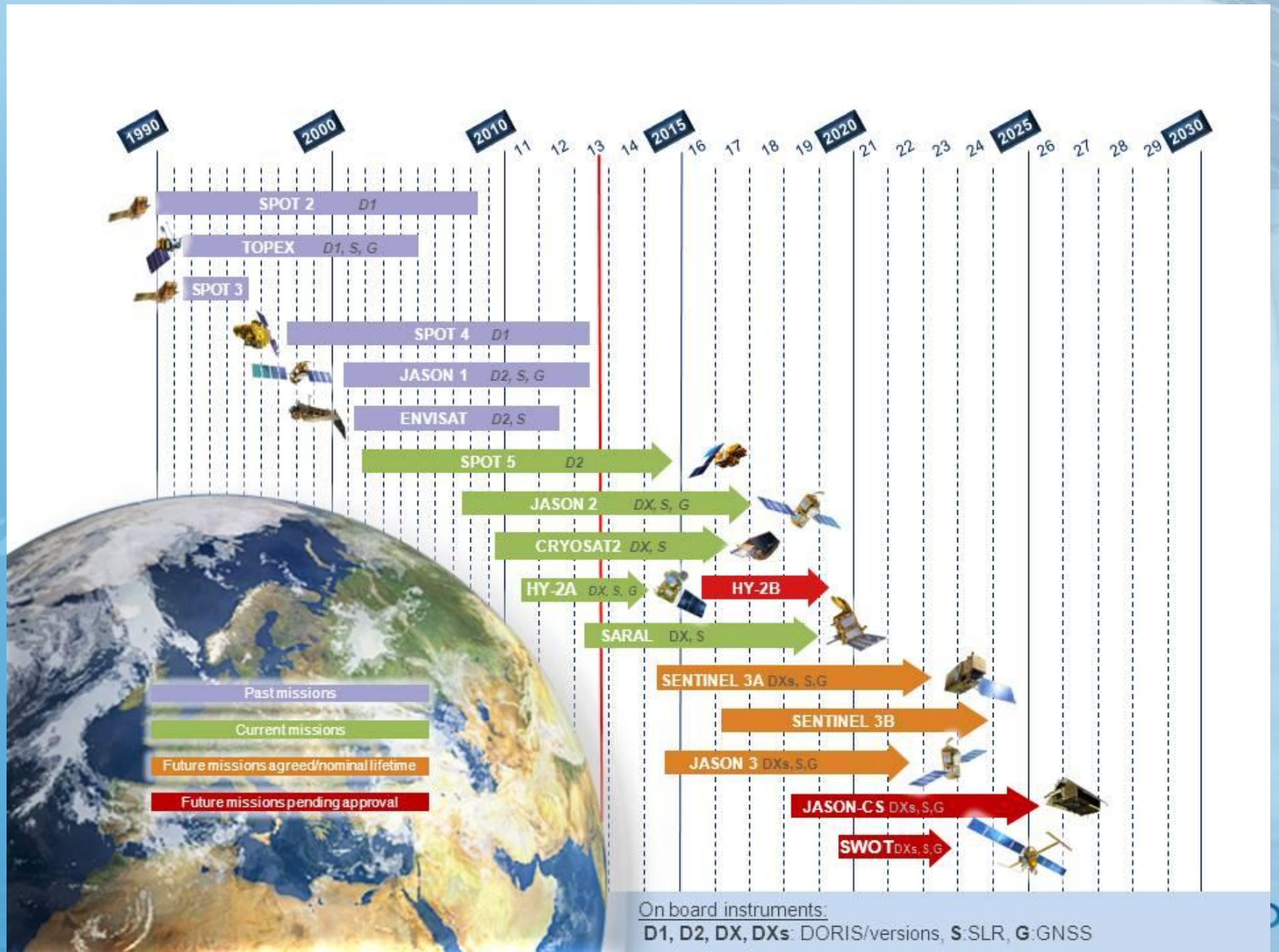
Satellite	Agencies	Altitude (km)	Inclin.	Dates
DGXX Receiver (7 channels)				
Jason-2	NASA/CNES/EUMETSAT/NOAA	1336	66°	June 2008 → 2017
Cryosat-2	ESA	717	92°	April 2010 → 2017
HY-2A	CNSA, NSOAS	960	99°	August 2011 → 2014 (AC)
SARAL	ISRO, CNES	800	98.5°	Feb. 2013 →
DGM Receiver (2 channels)				
SPOT-5	CNES	830	98°	May 2002 → 2015.

- **SPOT-4: Decommissioned, June 2013. (**launched 1998**)**
- **Jason-1: End of mission, July 2013. (**launched Dec. 2001**).**

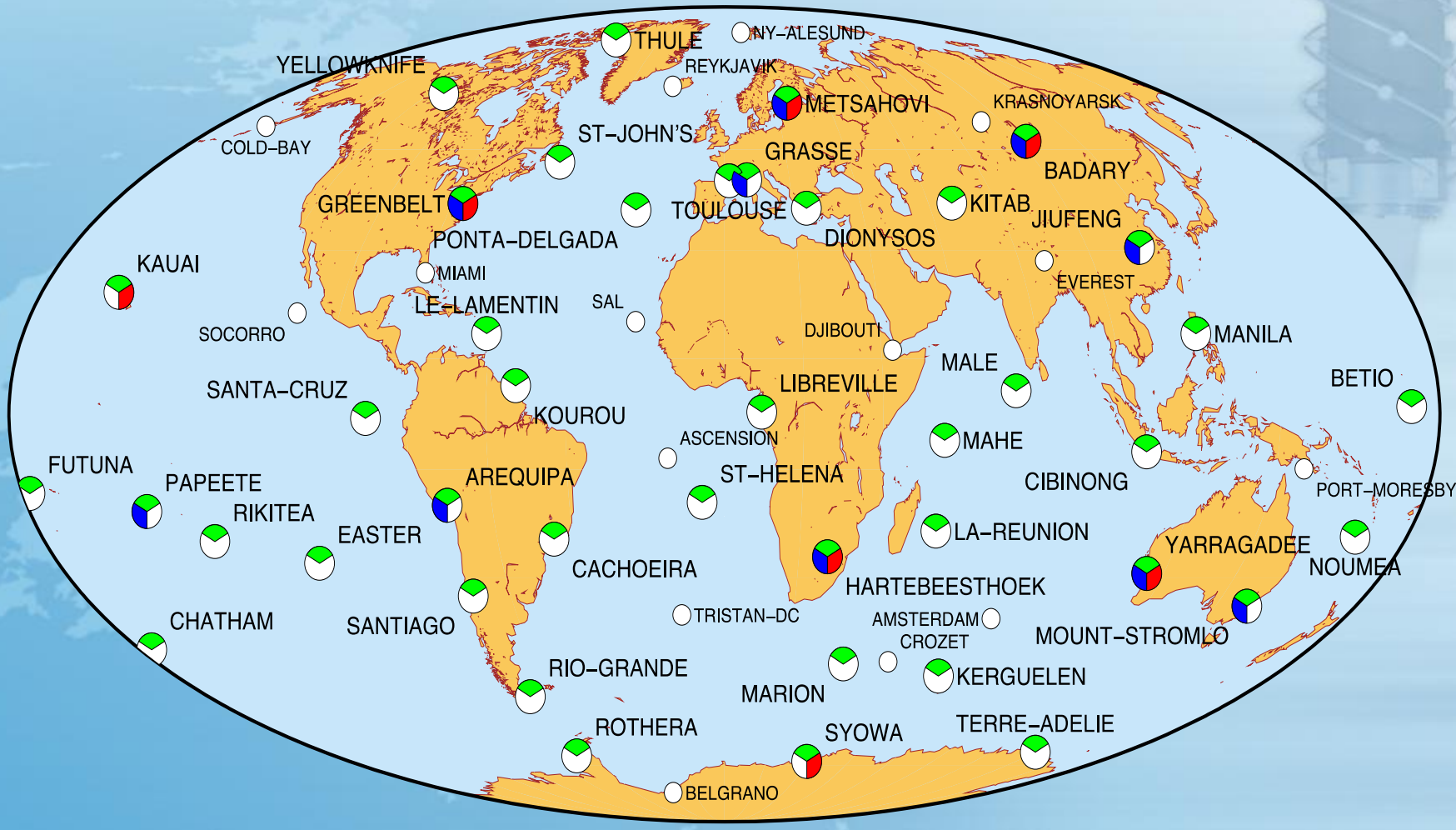
DORIS Constellation Status - Future Missions

Satellite	Agencies	Altitude (km)	Inclin.	Dates
DGXX Receiver (7 channels)				
Sentinel-3A, Sentinel-3B	ESA	814	98.6°	2015, 2017
Jason-3	NASA/CNES/EUMETSAT/NOAA	1336	66°	2015 → 2020
HY-2B, C, D	CNSA,	960	99°	2014, 2016, 2018 (3 yrs)
Jason-CS A,B	EUMETSAT/NOAA	1336	66°	2019, 2025
SWOT	NASA/CNES	970	78°	2020

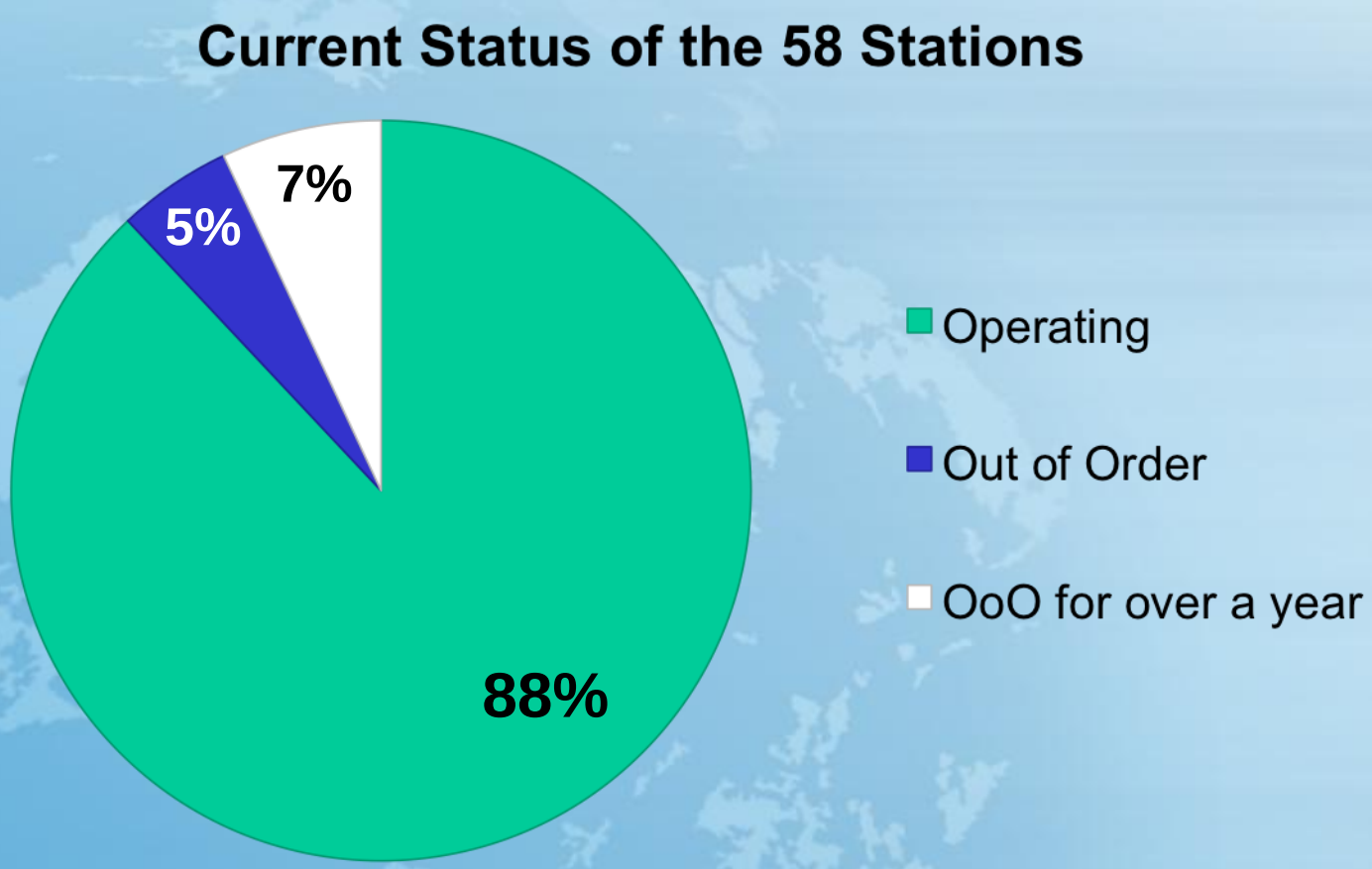
DORIS Constellation Summary



Current DORIS tracking network (Nov. 2013)



Network status



<u>Out of order for over a year</u>:
Yuzno-Sakhalinsk *(11/2005)*; **Santa Cruz** *(06/2009)*; **Soccoro** *(10/2009)*; **Monument Peak** *(02/2010).*

Network evolution

- **SHORT TERM (Next 6 MONTHS):**
  - **Syowa, Antarctica**: renovation and local tie survey.
  - **Chatham, NZ**: re-location 18km SE (co-location with new GNSS station).
  - **Kitab, UZ**: major renovation (station re-location to get better visibility).
  - **Socorro, Mex.**: major renovation (station re-location to get better visibility).
  - **Port-Moresby, PNG**: site to be closed, search for new location.

- **LONGER TERM:**
  - **Goldstone, CA**: new station in place of Monument Peak.
  - **Miami, FL**: definitive shutdown (interference with mobile-TV relays).
  - **Managua, Nicaragua:** new station in place of Miami.
  - **Chichijima & Hokkaïdo, JA**: new stations waiting for frequency clearance.
  - Major renovations: **Easter Island (Chile).**

- **IDS projects:**
  - **Sejong, Korea**: under negotiation with KASI, DORIS+GNSS+SLR+VLBI.
  - **Wake Island, US**: under negotiation but a real challenge!
  - **Gavdos, Greece**: moving of station under study.

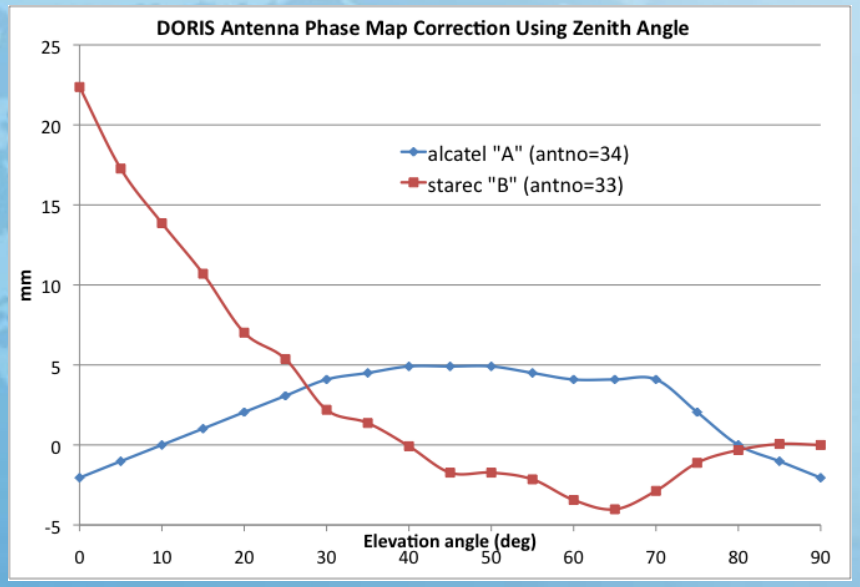
IDS DATA CENTER AND DATA FLOW UPDATE

Flow of data and products to two IDS data centers (CDDIS and IGN) continues to work well.

- SARAL DORIS data archive began in March in both DORIS and RINEX formats.
- Jason-1 and SPOT-5 test data set reprocessed with SSA corrective models made available.
- Archived numerous product files in support of AWG test operational products.
- Approximately 50K DORIS-related files (40Gb) downloaded from CDDIS each month.

DORIS Ground Antenna Characterization (1/1)

- **Updated Starec antenna phase law provided by CNES to DORIS Analysis Centers for use in ITRF2013; Separate phase law provided for Alcatel antenna.**
- **Starec antenna phase variations were measured in anechoic chamber by CNES – following request of IDS GB & the IERS.**
- **4 of 6 ACs have successfully implemented the phase law in their software (**as of Dec. 2013**).**



Analysis Update

1. **Six active DORIS analysis centers (ESA, GOP, GSC IGN, INA, LCA). GFZ has previously expressed interest – but no news in course of 2013.**
1. **DORIS ACs routinely submit SINEX solutions each quarter (e.g. 3/30, 6/30, 9/30, 12/30) which are now processed by IDS Combination Center (**Guilhem Moreaux, CLS Toulouse**).**
2. **In the past year we have conducted campaigns to analyze the impact of improved modelling of DORIS beacon frequency correction, improve surface force modelling for DORIS satellites, application of DORIS phase law, and inclusion of Jason-1.**
3. **AWG meetings in Toulouse (**April 2013**) and Washington DC (**October 2013**).**
4. **<u>ITRF2013 Preparations</u>:**

I. Require all ACs to reprocess data with updated geophysical models

(*eg new gravity models, estimation of daily station troposphere gradients, updated nonconservative force models, and revalidated attitude models***).**

II. Conduct test combinations over discrete periods for validation for new satellite data (*e.g. Jason-1, HY2A***).**

III. Conducted inter-comparison between ACs analyzing residual empirical once-per-rev (OPR) empirical acceleration amplitude which revealed each AC had individual modelling problems on at least one satellite.

IV. Three AC's have delivered preliminary series (1993 – 2013) to IDS Combination Center (ESA, GSC, LCA). GOP on schedule to deliver in Jan. 2013.

Curent IDS Governing Board

Name	Institution	Country	Mandate
Richard Biancale	CNES	France	Member at large
Pascale Ferrage	CNES	France	System representative
Frank Lemoine	GSFC	USA	Analysis Coordinator
Brian Luzum	USNO	USA	IERS representative
Guilhem Moreaux	CLS	France	Combination Center representative
Carey Noll	GSFC	USA	Data flow Coordinator
Michiel Otten	ESOC	Germany	IAG representative
John Ries	U. Texas/CSR	USA	Member at large
Jérôme Saunier	IGN	France	Network representative
Laurent Soudarin	CLS	France	Director IDS Central Bureau
Pascal Willis (chair)	IGN/IPGP	France	Analysis Center representative

IDS Represenatives to External Entities

IDS Representative to IAG	Pascal Willis
IDS Representatives to the IERS	Frank Lemoine, Jérôme Saunier
IDS Delegate to the GGOS Steering Committee	Pascal Willis; Alternate. F. Lemoine
IDS Rep. to the GGOS Consortium	Pascal Willis; Alternate. L. Soudarin

Next IDS Meetings

IDS AWG – Paris (CNES), March 2014 (*Before EGU. Finalize last issues with IDS Contribution to ITRF2013***.)**

IDS Workshop, (*in tandem with OSTST, Konstanz, Germany***) October 27-28 2014.**

IDS plot tools (1)

- In February 2012, a new set of tools was put on line at the IDS web site to interactively build and display graphs of DORIS station coordinates time series and orbit residuals: http://ids-doris.org/plot-tools.html

- A new version of the IDS web tools was released in December 2013 and will be open to users in early 2014.

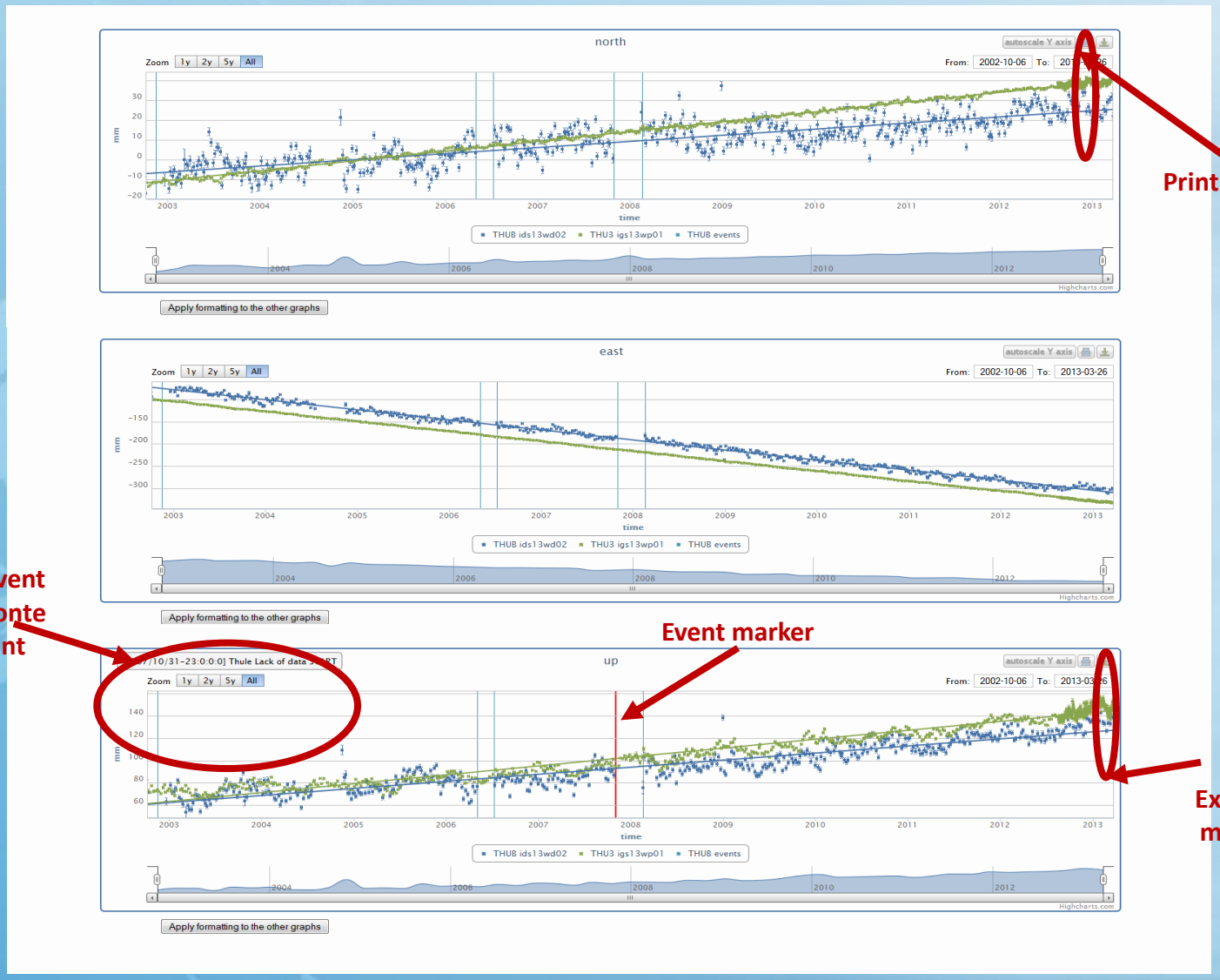
  Apart from new web design, this new version implements two major features:

  (1) it allows any user to compare time evolution of coordinates for DORIS and co-located GNSS stations by plotting both in the same graph.

  (2) the new release offers a user-friendly web interface to easily identify and select DORIS sites as well as co-located GNSS stations where IDS and IGS (and eventually later on ILRS and IVS) coordinates times series are available for display.

- See poster « Interactive visualization tool for station coordinates time series of DORIS and other space geodetic techniques at co-located sites » (G51A-0884) on Friday morning.

IDS plot tools (2)



http://ids-doris.org