



***IDS, Product and Service Status***

***UAW GGOS***

***Zurich, Switzerland***

***September 16, 2011***



# DORIS – last news

**HY-2A successfully launched on August 15 2011.**

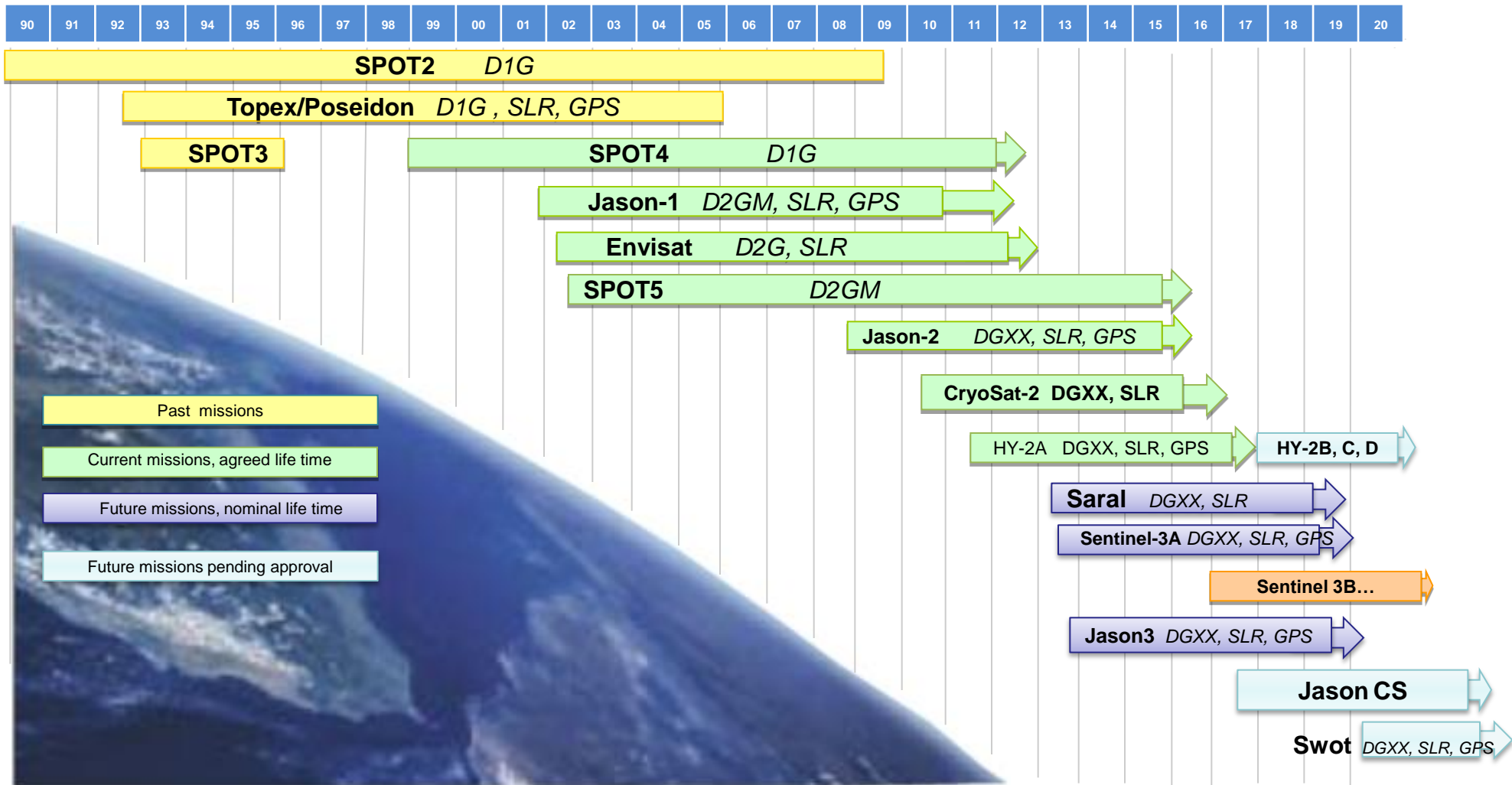
Chinese oceanographic satellite

DORIS and GPS instruments switched on on August 31.

DORIS converged in less than 5h and works nominally.

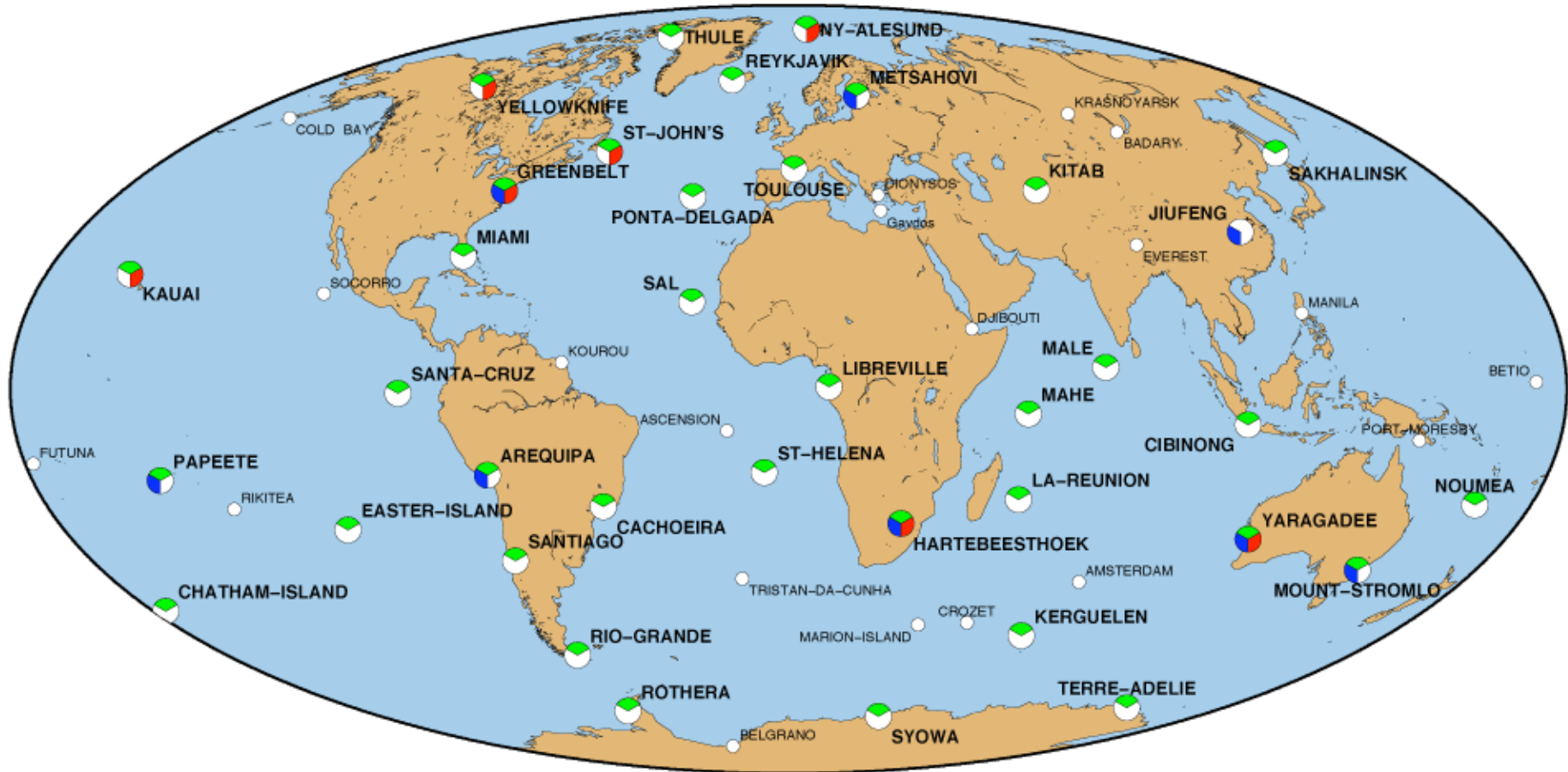
DORIS data will be provided to IDS once the final orbit is reached (Dec.)

# DORIS CONSTELLATION SUMMARY



# Network (as of 2011)

DORIS stations co-located with other IERS techniques (VLBI, SLR or GNSS)



GNSS (IGS)

SLR

VLBI

No active co-location < 10 km

# IDS – status

## Components:

- 2 Data Centers: IGN, CDDIS
- 7 Analysis Centers: ESA, Geoscience Australia, NASA/GSFC, Geodetic Observatory Pecny, INASAN, IGN, CNES/CLS (LCA)
- 1 Combination Center (CNES/CLS)

## Activities:

- ACs regularly deliver products to DC. Weekly sinex evaluation by CC every quarter. Work in progress at CC to produce weekly combined solutions
- ACs work to include Cryosat-2 (5/7)
- Working group on DPOD2008, extension set of ITRF2008 to include new stations (ch. P. Willis)

**GB:** ToR revised, approved by IAG EC, applied end of current term (end 2012)

## Next events:

- Analysis Working Group meeting, May 2012, Prag, Czech Republic
- IDS workshop, October 2012, Venice, Italy

# What could be the IDS information/data/products useful for the GGOS users?

What is DORIS?

DORIS web site <http://www.aviso.oceanobs.com/en/doris/index.html>

What about the network?

Maps <http://ids-doris.org/network/maps.html>

Network on Google Earth <http://ids-doris.org/network/googleearth.html>

Sitelogs <http://ids-doris.org/network/sitelogs.html>

Station Events <http://ids-doris.org/system/doris-stations-events.html>

What about the constellation?

System Events <http://ids-doris.org/system/doris-system-events.html>

What/where are the data, what/where are the products?

Information and data center organization <http://ids-doris.org/data-products/info.html>

IDS data structure and formats <http://ids-doris.org/analysis-documents/struct-dc.html>

## Quality of the data?

CNES POE statistics <http://ids-doris.org/system/poe.html>

CNES MOE statistics <http://ids-doris.org/system/moe.html>

Events impacting the data <http://ids-doris.org/system/events-impacting-data.html>

## Quality of the products?

Time series of station coordinates <http://ids-doris.org/network/ids-station-series.html>

## Tools for users?

Plottool: an interactive tool to plot time series of station coordinates and  
CNES POE post-fit residuals (soon online)

## How to use the data?

Documents <http://ids-doris.org/analysis-documents.html>

Bibliography <http://ids-doris.org/report/publications.html>

# About the stations



# DORIS stations (SITE LOGS) (<http://ids-doris.org/network/sitelogs.html>)



## Site logs

[EVEB200812.LOG](#) (current; see below)

[EVEB200707.LOG](#)

[EVEB200701.LOG](#)

[EVEB200507.LOG](#)

[EVEB200405.LOG](#)

## Plots

[Time series of coordinates](#)

[CNES POD MOE statistics](#)

[CNES POD POE statistics](#)

## Other pictures

[EVEB-1.jpg](#)

## Site news

### Doris mails

[No\\_0569](#) ITRF2005-DPOD2005 coordinates for all DORIS

### Local events

None

## EVEREST DORIS site description form

### 0. Form

Prepared by : SIME (DORIS installation and maintenance department)

Date prepared : 9/12/2008

Report type : UPDATE

### 1. Site location information

Site name : EVEREST

Site DOMES number : 21501

Host agency : EV-K2-CNR Committee

City : Near the Everest base camp

State or province :

Country : NEPAL

Tectonic plate (PB2002) : Eurasia

Geological information :

Geographical coordinates ( ITRF ) :

North Latitude : 27 deg 57' 29''

East Longitude : 86 deg 48' 47''

Ellipsoid height : 4962 m

Approximate altitude : 5050 m

### 2. DORIS antenna and reference point information

#### 2.1

Four character ID : EVEB

Antenna model : Starec 52290 type

Antenna serial number : 17

IERS DOMES number : 215018001

CNES/ IGN number : 215011

CTDP number : 28

Date installed (dd/mm/yy) : 22/05/1992

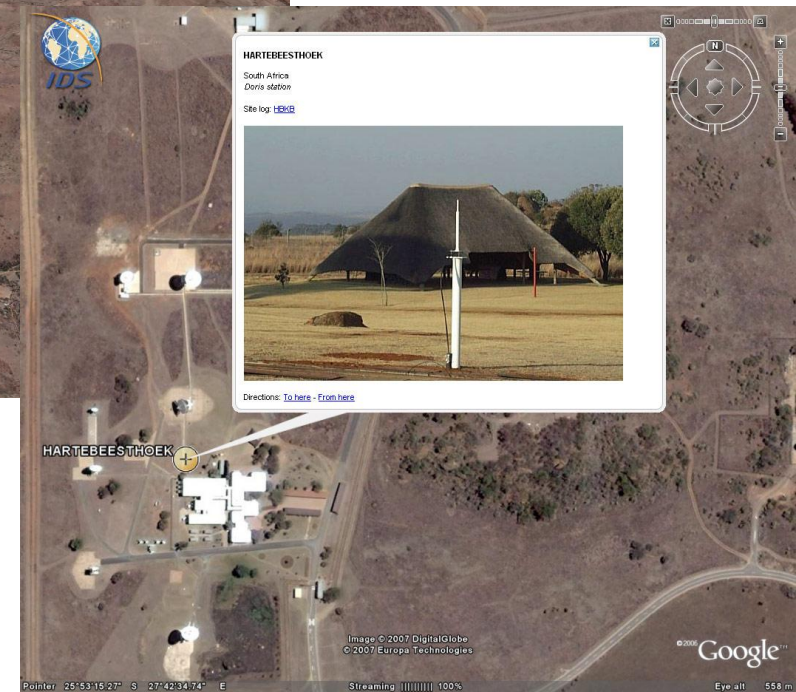
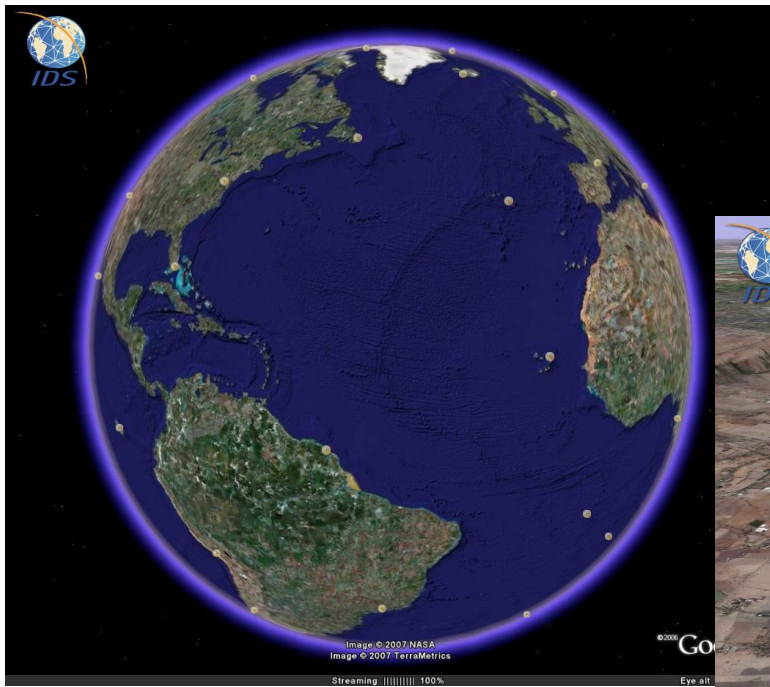
Date removed (dd/mm/yy) :

Antenna support type : 0.3 metre tower

Installed on : Rock

Height above ground mark : 0.782 m

# Network on Google Earth (<http://ids-doris.org/network/googleearth.html>)



KML file to open with Google Earth

[http://ids-doris.org/documents/doris/stations/DORIS\\_stations\\_2010-02-02.kmz](http://ids-doris.org/documents/doris/stations/DORIS_stations_2010-02-02.kmz)

## DORIS Stations Events ( <http://ids-doris.org/system/doris-stations-events.html> )

<u>Date</u>	<u>Location</u>	<u>Acronym</u>	<u>DOMES</u>	<u>Date of event or source</u>	<u>Information provided</u>	<u>Source</u>	<u>Comment</u>
2011-07-31	Rikitea	RIMB	92301S004	EVENT	RIMB START	dorismail 0769	
2011-07-31	Rikitea	RILB	92301S003	EVENT	RILB END	dorismail 0769	
2011-07-29	Noumea	NOXB	92701S004	EVENT	NOXB START	dorismail 0768	
2011-07-27	Noumea	NOWB	92701S003	EVENT	NOWB END	dorismail 0768	
2011-07-05	Easter-Island	EASB	41703S009	EVENT	data gap (beacon failure) END	dorisstations 2011/08/08	The beacon has been replaced and the new one has been working nominally since July 05, 2011
2011-05-30	Terre-Adelie	ADFB	91501S003	EVENT	ADFB END	dorismail 0754	
2011-05-30	Terre-Adelie	ADGB	91501S004	EVENT	ADGB START	dorismail 0754	
2011-05-30	Terre-Adelie	ADFB	91501S003	EVENT	invalid data (problem of maser & antenna failure) END	dorisstations 2011/06/08	
2011-05-09	Noumea	NOWB	92701S003	EVENT	data gap (beacon replacement) START	dorisstations 2011/05/13	

Automatically updated with  
« DORISstations » mails  
(see example opposite)

[dorisstations@ids-doris.org](mailto:dorisstations@ids-doris.org)

Please find here after, information about DORIS DATA / STATION EVENT:

- \* Site : Easter Island
- \* Mnemo : EASB
- \* Event Start : 2011/01/14
- \* Event End : 2011/07/05
- \* Type of Event : beacon failure
- \* Consequence on data : data gap
- \* Comment : The beacon has been replaced and the new one has
- \* been working nominally since July 05, 2011.

# **About the DORIS constellation**

## DORIS System Events (<http://ids-doris.org/system/doris-system-events.html>)

<u>Date</u>	<u>Origin</u>	<u>Consequence</u>	<u>Element</u>	<u>Description</u>
2011/09/11 22:19:16	On board	All data available	JASON1	Orbit Maintenance Maneuver (end : 2011/09/11 22:20:15 TAI)
2011/09/09 02:31:20	On board	All data available	JASON1	Orbit Maintenance Maneuver (end : 2011/09/09 04:11:38 TAI)
2011/09/07 22:42:09	On board	All data available	JASON1	Orbit Maintenance Maneuver (end : 2011/09/08 01:36:50 TAI)
2011/09/05 22:52:58	On board	All data available	JASON1	Orbit Maintenance Maneuver (end : 2011/09/06 01:52:14 TAI)
2011/09/04 23:29:59	On board	All data available	JASON1	Orbit Maintenance Maneuver (end : 2011/09/05 02:24:21 TAI)
2011/09/01 11:13:43	On board	All data available	CRYOSAT2	Orbit Maintenance Maneuver (end : 2011/09/01 11:16:35 TAI)
2011/08/28 09:59:55	On board	All data available	JASON2	Orbit Maintenance Maneuver (end : 2011/08/28 10:00:47 TAI)
2011/08/23 00:38:33	On board	All data available	ENVISAT1	Orbit Maintenance Maneuver (end : 2011/08/23 00:38:35 TAI)
2011/08/17 22:46:22	On board	All data available	ENVISAT1	Orbit Maintenance Maneuver (end : 2011/08/18 00:26:59 TAI)
2011/08/11 00:55:16	On board	All data available	ENVISAT1	Orbit Maintenance Maneuver (end : 2011/08/11 02:35:32 TAI)
2011/08/02 13:30:31	Ground	Less data available	DORIS/SPOT4	Ground acquisition failure. No data from 2011/08/02 13:30:31 TAI to 2011/08/02 18:07:41 TAI
2011/07/28 04:25:14	On board	All data available	CRYOSAT2	Orbit Maintenance Maneuver (end : 2011/07/28 04:28:17 TAI)
2011/07/14 23:23:20	On board	All data available	SPOT4	Orbit Maintenance Maneuver (end : 2011/07/15 00:14:21 TAI)

# About the data quality

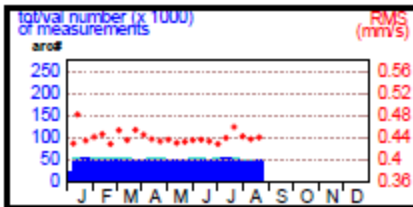


# DORIS statistics - CNES/SOD POE orbits (<http://ids-doris.org/system/poe.html>)

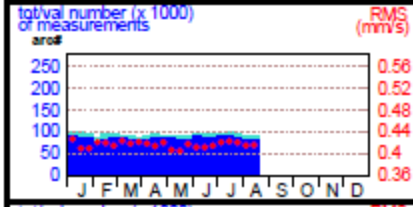
2011 - POE global statistics

2011 - POE statistics

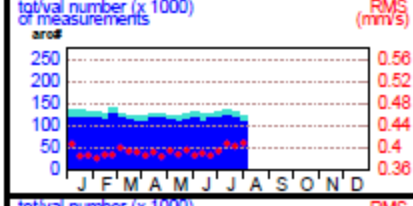
SPOT4



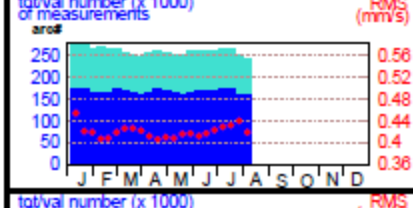
SPOT5



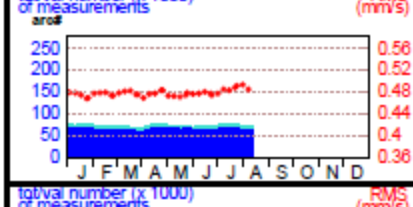
JASON1



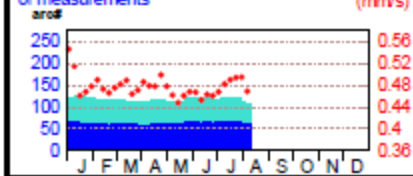
JASON2



ENVISAT



CRYOSAT2

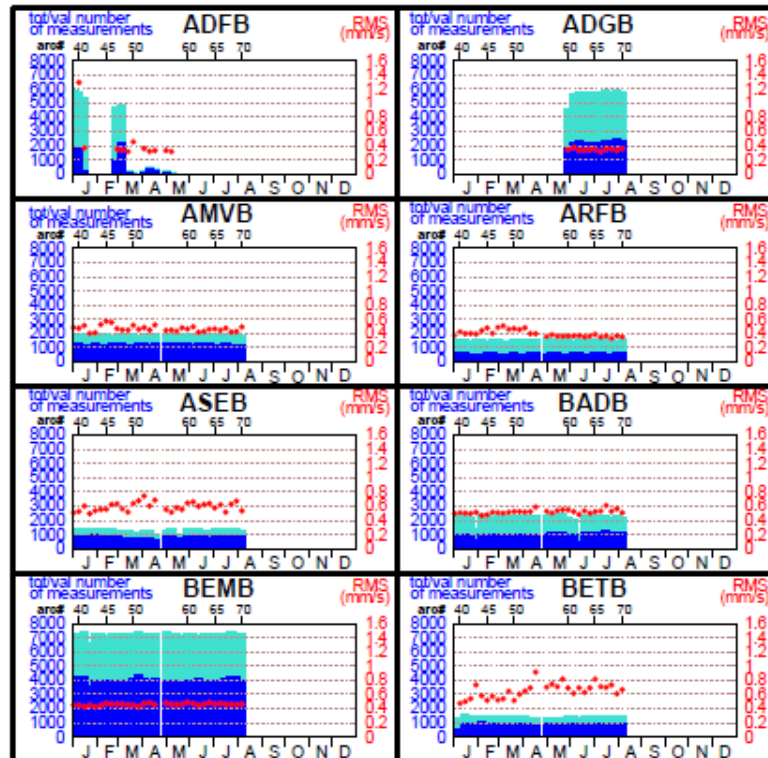


## Global statistics per satellite

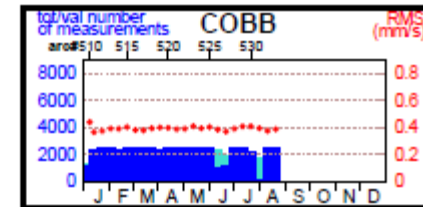
## Statistics per station

## Statistics per satellite

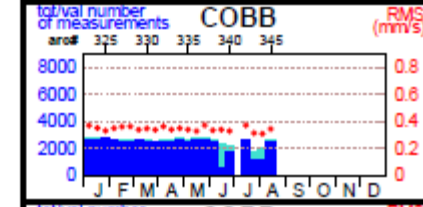
2011 - CRYOSAT2 POE statistics (1/5)



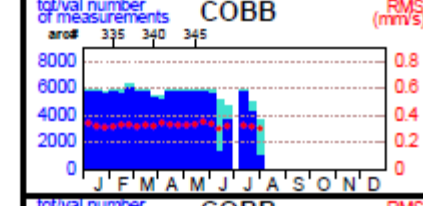
SPOT4



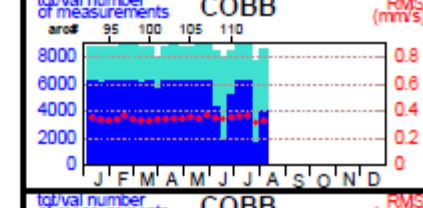
SPOT5



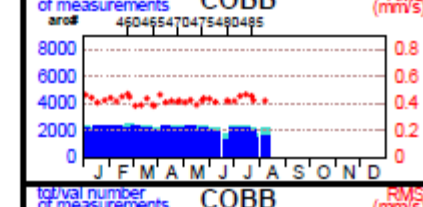
JASON1



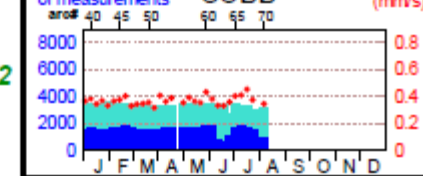
JASON2



ENVISAT



CRYOSAT2



# History of events impacting the data (<http://ids-doris.org/system/events-impacting-data.html>)

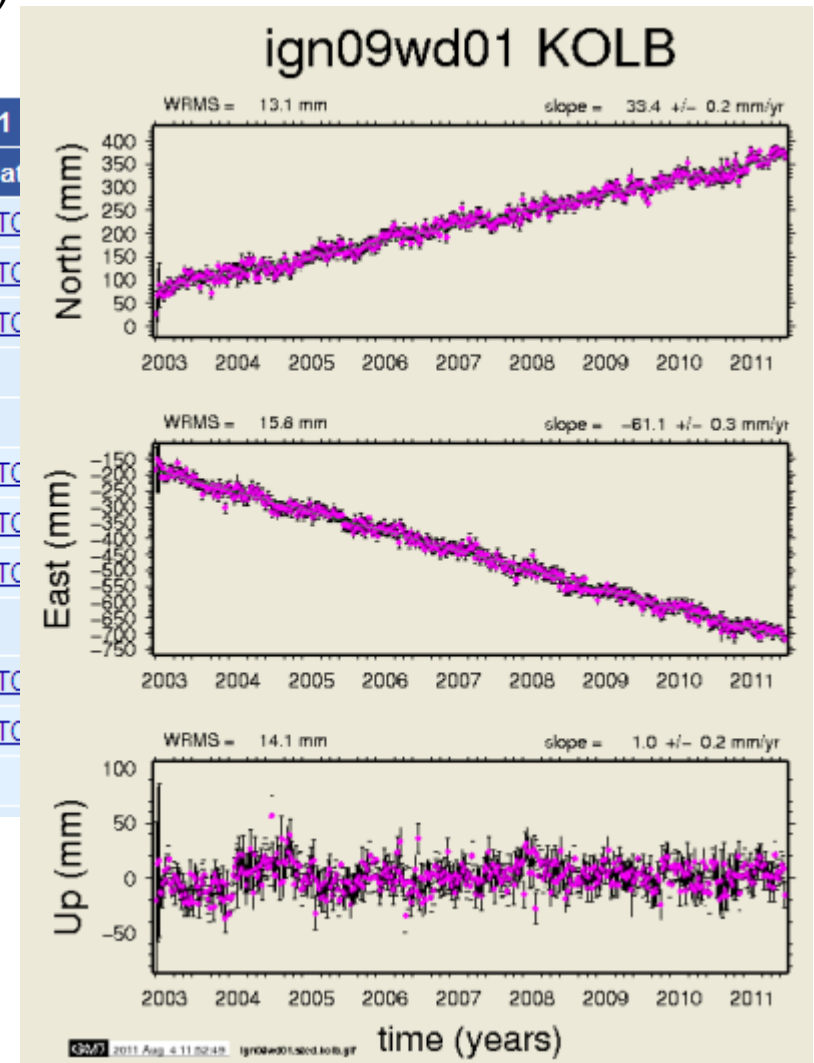
A	B	C	D	E	F	G	H	I	J
date (yyyy/mm/dd)	Spot2 launch: 22-Jan-1990	Copex 10-Aug-1992	Spot3 26-Sep-1993	Spot4 launch: 24-Mar-1998	Jason1 7-Dec-2001	Spot5 4-May-2002	Envisat launch: 1-Apr-2002	Jason2 20-Jun-2008	Cryosat2 8-Apr-2010
2005/09/27		On-board acquisition: minimum elevation angle at 12 deg except: 15 deg for TLHA and KRYB 20 deg for EYEB + ADEB, BEMB, FAIB, METB, REZB, RIOB, ROTB, SPJB, SYPB, THUB, YELB		POE GDRB. This new configuration is set up on 2005/09/27. Wrt to the previous one, an additional bias of +6.0 microseconds is applied to the onboard Doppler time transits of chain1 from 2005/09/27		Onboard Doppler time transit new values for chain1: 400 Mhz : 71.73 + 6.0 = 77.73 microseconds 2 GHz: 49.09 +6.0 = 55.09 microseconds			
2005/11/09		POE pre-processing (unchanged): threshold at 12 deg  => still no data under 12 deg				No more flagged data between 8 and 12 deg, only data over 12 deg in data files starting from file sp5data133		ON-board acquisition (CHANGED): minimum elevation angle at 12 deg for ALL the stations POE pre-processing: threshold at 12 deg (unchanged)  => no data under 12 deg	
2006/01/18	selection of high-latitude stations in data files starting from sp2data574	Previously, at least over 2005, (exact period is not known for now) 15 deg. for TLHA and KRYB 17 deg for five high-latitude stations: ADEB, FAIB, METB, SYPB, YELB 20 deg for EYEB	selection of high-latitude stations in data files starting from sp4data326						
2006/04/14		12 deg for the others and POE pre-processing: threshold at 12 deg				T Payload anomaly.DORIS reset. No data from 2006/04/14 to ???			



**About the product quality**

IDS time series of station coordinates  
 (<http://ids-doris.org/network/ids-station-series.html>)

The DORIS stations list			ign09wd01		Ica05md01	
Name	Country	Code	Graph	Data	Graph	Data
AMSTERDAM	France (T.A.A.F.)	AMSA	<a href="#">GIF</a>	<a href="#">STCD</a>	<a href="#">GIF</a>	<a href="#">STCD</a>
		AMSB			<a href="#">GIF</a>	<a href="#">STCD</a>
		AMTB	<a href="#">GIF</a>	<a href="#">STCD</a>	<a href="#">GIF</a>	<a href="#">STCD</a>
		AMUB	<a href="#">GIF</a>	<a href="#">STCD</a>		
		AMVB	<a href="#">GIF</a>	<a href="#">STCD</a>		
AREQUIPA	Peru	AREA	<a href="#">GIF</a>	<a href="#">STCD</a>	<a href="#">GIF</a>	<a href="#">STCD</a>
		AREB	<a href="#">GIF</a>	<a href="#">STCD</a>	<a href="#">GIF</a>	<a href="#">STCD</a>
		ARFB	<a href="#">GIF</a>	<a href="#">STCD</a>	<a href="#">GIF</a>	<a href="#">STCD</a>
ARLIT*	Niger	ARLA				
		ARMA	<a href="#">GIF</a>	<a href="#">STCD</a>	<a href="#">GIF</a>	<a href="#">STCD</a>
ASCENSION	U.K. (South Atlantic Ocean)	ASDB	<a href="#">GIF</a>	<a href="#">STCD</a>	<a href="#">GIF</a>	<a href="#">STCD</a>
		ASEB				



# STCD: IDS format for STation Coordinate Differences time series

Exchange format based  
on SINEX blocks

```
+FILE/REFERENCE
DESCRIPTION --IGN/JPL DORIS Analysis Center
OUTPUT -----Weekly position residuals
CONTACT -----Pascal Willis <pascal.willis@ign.fr>
SOFTWARE -----Gipsy/Oasis II (Jet Propulsion Laboratory, Caltech)
HARDWARE -----PC -- Linux86
INPUT -----All satellite DORIS data
-FILE/REFERENCE
*
+FILE/COMMENT
FIELDS - modified julian date, dX, dY, dZ, sX, sY, sZ, dEast, dNorth, dUp, sEast, sNorth, sUp
FORMAT - 2x,f7.1,2(2x,3(1x,f6.1),3(1x,f5.1))
UNITS - all position residuals in millimeters
REFERENCE SYSTEM -- ITRF2005 using ign09d02 for transformation
EARTH ELLIPSOID -- flattening factor: 298.257810 equatorial radius: 6378136.0 m
-FILE/COMMENT
*
+SITE/ID
*Code Pt __ Domes __ T __ Station Description __ Longitude __ Latitude __ Height
kolb -- A 40424S009 D KOKEE PARK -----200 20 04.7 --22 07 23.0 --1168.0
-SITE/ID
*
+SOLUTION/APRIORI
*Index __ Type __ Code Pt Soln __ Ref_Epoch __ Unit S __ Estimated Value __ Std_Dev
-----1 STAX -- kolb -- A ---- 05:001:43200 m -- 2 --5.54398130870000e+06 0.00000e+00
-----1 STAY -- kolb -- A ---- 05:001:43200 m -- 2 --2.05458446510000e+06 0.00000e+00
-----1 STAZ -- kolb -- A ---- 05:001:43200 m -- 2 --2.38748082820000e+06 0.00000e+00
-SOLUTION/APRIORI
*
--52598.5 --37.2 --182.2 --16.6 --63.6 --75.2 -- 52.1 --183.8 --26.1 --20.1 --70.3 --49.2 --71.0
--52605.5 --40.3 --146.0 --66.6 --70.0 --102.1 -- 61.8 --150.9 --66.6 --13.1 --103.3 --58.7 --70.9
--52613.5 --37.9 --155.6 --87.6 --71.6 --95.2 -- 53.8 --159.1 --88.1 --15.8 --99.4 --48.2 --69.8
--52619.5 --20.9 --169.6 --62.5 --15.2 --18.2 -- 12.9 --166.3 --72.7 --12.9 --18.6 --12.8 --14.7
--52626.5 --34.1 --209.6 --64.2 --12.9 --16.1 -- 11.4 --208.4 --74.9 --13.7 --16.2 --11.3 --12.8
--52633.5 --35.2 --178.9 --58.4 --12.8 --16.3 -- 11.6 --180.0 --65.1 --5.0 --16.6 --11.5 --12.6
```

Format description [http://ids-doris.org/documents/report/CB\\_STCD\\_format\\_v1.0.pdf](http://ids-doris.org/documents/report/CB_STCD_format_v1.0.pdf)

Reference:

Noll, C.; Soudarin, L. 2006. On-line Resources Supporting the Data, Products, and Information Infrastructure for the International DORIS Service, in DORIS Special Issue, P. Willis (Ed.), *JOURNAL OF GEODESY* 80(8-11):419-427, DOI: [10.1007/s00190-006-0051-y](https://doi.org/10.1007/s00190-006-0051-y)

# Plottool: a new tool soon online

An interactive tool to plot time series of station coordinates and CNES POE post-fit residuals (soon online)

POE statistics (poetool)

Time series of station coordinates (stcdtool)

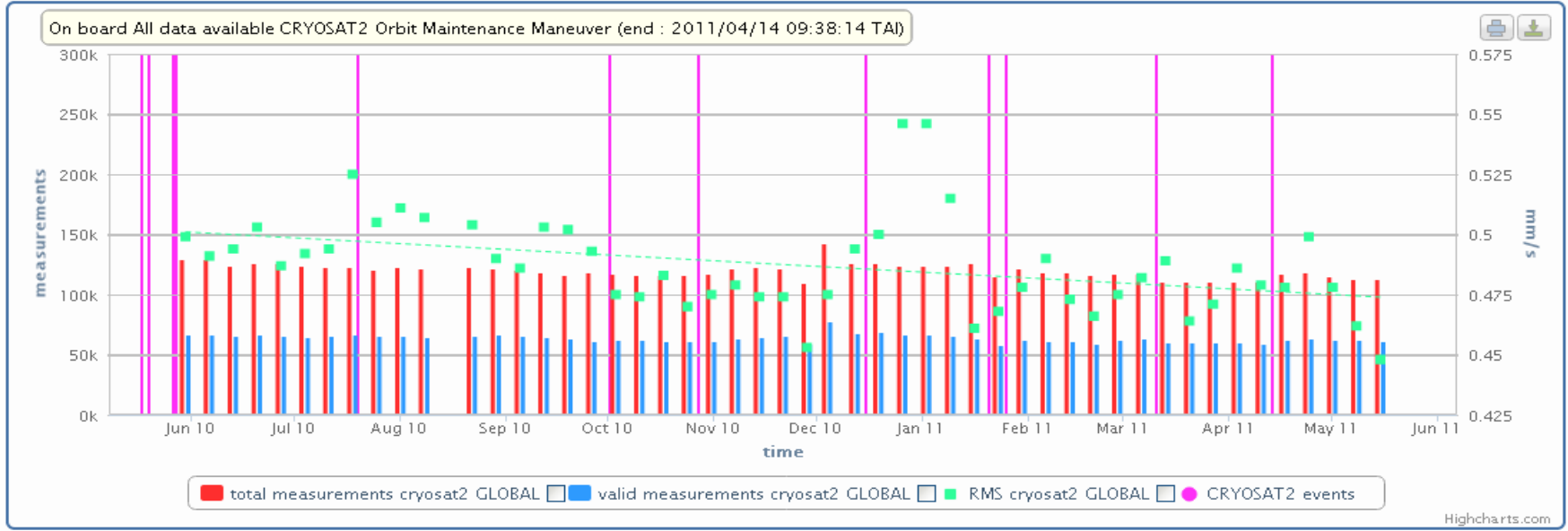
Many functions:

- adding station and system events
- statistics
- editing
- export
- ...

# POE statistics (poetool)



- Select Data
- Graphs appearance
- Statistics
- Edit



# Time series of station coordinates (stcdtool)



# Future developpements

## Combination center:

- create STCD, Gif and Plottool files for the IDS combined products

  - Coordinate times series

  - Geocenter, scale

  - EOP

## Station information:

- add earthquakes history in the vicinity of the DORIS stations (USGS bulletins)

- complete the list of the station events (beacon change, OUS change...)



<http://ids-doris.org>



Australian Government  
Geoscience Australia

INSTITUTE OF ASTRONOMY  
RUSSIAN ACADEMY OF SCIENCES



Newcastle  
University