



IDS services for sharing DORIS data and products

IDS metadata for web applications

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Information provided by IDS

- DORIS data
 - DORIS measurements and ancillary data
 - ftp download from Data Centers and Central Bureau
- IDS products
 - Produced by Analysis Centers and Combination Center
 - ftp download from Data Centers
- Documents
 - Technical documents, presentations, reports, mails,...
 - download from IDS website
- Metadata for web applications
 - Numerical values, texts, links ...
 - Stored in a data base

IDS services

A web site

<http://ids-doris.org>

International DORIS Service

IDS is an international service which provides support through DORIS data and products, to geodesy, geodesy-related and other research and operational activities.

- IDS**
Organization of the service and documents, access to the data and products, event announcements, contacts and links.
- DORIS System**
Allows to access general description of the system, and gives information about the system events and the tracking network.
- Analysis Coordination**
Provides information and discussion areas about the analysis strategies and models used in the IDS products. It includes also the information about the Combination Center activities.
- Web service**
Gives access to DORIS-D.T. the IDS Web service, that proposes a family of plot tools to visualize time series of DORIS-related products and a network viewer to select sites.

Acknowledge IDS
Whenever you use IDS data, products, or results in a publication, please include a proper citation.

Survey

WHAT'S NEW ON IDS

- IDS - December 2016**
New Chair of the IDS Governing Board from January 1, 2017 (dorismat)
- IDS - October 2016**
Jason-2 data: No orbit file and no DORIS 2 data are available on IDS data Centers during the period of orbit change.

A web service

<http://ids-doris.org/webservice>

DORIS Online Tools
The IDS Web service

- Station Position
- Orbit residuals
- Combination parameters
- Earth Orientation Parameters
- Network viewer

This page is also accessible with the link: <http://ids-doris.org/webservice>. It is suggested for citation of the IDS webservice and its tools. See [here](#) how to acknowledge the IDS in your papers and presentations.

The IDS Web Service

The IDS Web service provides tools to browse **time series** of DORIS-related products.

Besides products provided by the CNES Orbitography Team and the IDS components (Analysis Centers and Combination Center), this service allows comparing time evolutions of coordinates for DORIS and GNSS stations in co-location, thanks to a collaboration with the **IGS Terrestrial Frame Combination Center**.

The tools

The tools proposed by this web service are:

Station position

Station position differences at observation epochs relative to a reference position (North, East and Up trended time series).

Combination parameters

Combination parameters i.e. outputs of the IDS Combination Center analysis (WRMS of station position residuals, scale and translation parameters, number of stations used in the analysis).

Earth Orientation Parameters

Earth Orientation Parameters from the IDS Combination Center analysis (Xp, Yp, LOD).

Orbit residuals

Orbit residuals and amount of station measurements from CNES Precise Orbit Ephemeris processing (RMS of post-fit orbit residuals, total and validated number of DORIS measurements per arc).

Network viewer

A network viewer to select sites. You can access to the **DORIS combined time series** from the IDS Combination Center and **GNSS combined time series at collocated sites** from the IGS TRF Combination Center.

IDS metadata

- Currently, they provide information about:
 - **Satellites**: characteristics of the mission (start, end, instruments, orbit,...) ; photo; video; links to mass and maneuvers files
 - **Stations**: characteristics of the station (start, end, DOMES number, site, technique, ...); links to photos, sitelogs, dorismails, ...
 - **Sites**: 'nom' [name], 'pays' [country], 'lat' [latitude], 'lon' [longitude], 'hauteur' [altitude]
 - **Events** (station, system, earthquake, data)
- They also include the time series of station positions (**PositionData**) (i.e. date, dn, de, du + sigmas) and the name of the **Series**

IDS metadata and web applications



HTTP request to
GET information
enclosed in JSON
format

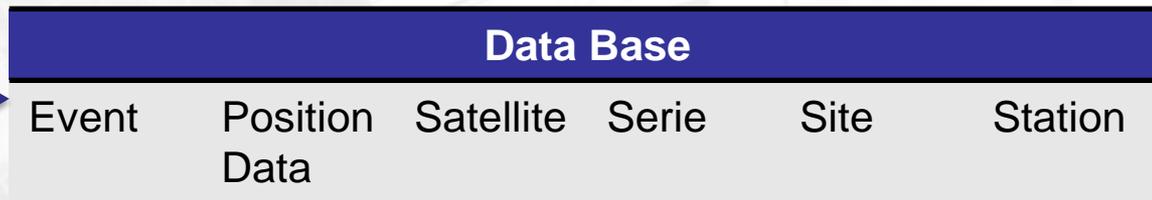


Content of
-files
-formatted mails
...

Application Programming Interface (API)

Links to
-images
-sitelogs
-stored txt mails
...

automatic
scripts for
parsing



Manual
entries

API query: some examples

- only Earthquake events (type 3):

https://apps.ids-doris.org/api/v1/event?q=event_type==3

- only the positions of station "ROUB" from time series ids17wd05 before 2008 :

[https://apps.ids-doris.org/api/v1/position/ids17wd05/roub?q=date<\"2008-01-01\"](https://apps.ids-doris.org/api/v1/position/ids17wd05/roub?q=date<\)

- only sites in the Northern Hemisphere

<https://apps.ids-doris.org/api/v1/site?q=lat>=0>

- only stations that belong to the site "Rothera" (id=1) :

<https://apps.ids-doris.org/api/v1/station?q=site==1>

API: query and response

← → ↻  Sécurisé | <https://apps.ids-doris.org/api/v1/satellite>

```
[
  {
    "id": 1,
    "nom": "SPOT-2",
    "nom_court": "SPOT2",
    "cospar": 9000501,
    "technique": 1,
    "launch_date": "1990-01-22 00:00:00",
    "mission_end_date": "2009-07-29 00:00:00",
    "periapsis": 802,
    "apoapsis": 831,
    "period": 100.9,
    "inclination": 98.7,
    "eccentricity": 0.002014,
    "launch_site": "Kourou, French Guiana",
    "vehicle": "Ariane 40",
    "doris_receiver_generation": "1G",
    "doris_redundancy": 0,
    "other_tracking_system": "",
    "doris_instrument_end": "2009-07-29 00:00:00",
    "images": "[352]",
    "attitudeLink": "",
    "manoeuverLink": "ftp://ftp.ids-doris.org/pub/ids/satellites/sp2man.txt",
    "massGravityCenterLink": "ftp://ftp.ids-doris.org/pub/ids/satellites/sp2mass.txt",
    "avisolink": "http://www.avisolink.fr/fr/missions/missions-en-cours/spot.html",
    "sp3_code": "L91",
    "video": ""
  },
  ...
]
```



IDS Website

Metadata and API are used to:

generate tables:

- table of events

- table of pdf files of CNES POE statistics

- table of stations

- table of satellites

create pages:

- page per site

- page per satellite

produce the xml file of the network for Google Earth



Example: satellite page of Sentinel-3A

← → ↻ 🔒 Sécurisé | <https://ids-doris.org/satellites/doris-satellite.html?code=SENTINEL-3A>

 **International
DORIS
Service**



Attributes

cospar :	1601101
launch_date :	2016/02/16
launch_site :	Plesetsk Cosmodrome, Russia
vehicle :	Rocket/Britz-KM
doris_instrument_end :	-
mission_end_date :	-
periapsis :	802 km
apoapsis :	807 km
period :	100.96 minutes
inclination :	98.62°
eccentricity :	0.0003
doris_receiver_generation :	DGXX-S
doris_redundancy :	Yes
other_tracking_system :	<u>SLR+GPS</u>
sp3_code :	L74

Events

Date	Origin	Info	Consequence
2017/04/27	on board	Orbit Maintenance Maneuver (end : 2017/04/27 10:58:44 TAI)	all data available
2017/03/15	on board	Orbit Inclination Maneuver (end : 2017/03/15 07:54:54 TAI)	all data available
2017/02/23	on board	Orbit Maintenance Maneuver (end : 2017/02/23 09:40:57 TAI)	all data available
2016/12/14	on board	Orbit Inclination Maneuver (end : 2016/12/14 08:58:42 TAI)	all data available
2016/12/01	on board	Orbit Maintenance Maneuver (end : 2016/12/01 08:00:44 TAI)	all data available
2016/11/01	on board	Orbit Maintenance Maneuver (end : 2016/11/01 12:05:50 TAI)	all data available
2016/09/22	on board	Orbit Maintenance Maneuver (end : 2016/09/22 07:50:11 TAI)	all data available
2016/08/31	on board	Orbit Inclination Maneuver (end : 2016/08/31 07:34:32 TAI)	all data available
2016/07/21	on board	Orbit Maintenance Maneuver (end : 2016/07/21 12:45:37 TAI)	all data available
2016/06/02	on board	Orbit Maintenance Maneuver (end : 2016/06/02 11:14:29 TAI)	all data available
2016/04/19	on board	Orbit Inclination Maneuver (end : 2016/04/19 12:10:21 TAI)	all data available
2016/04/13	on board	Orbit Maintenance Maneuver (end : 2016/04/13 10:52:44 TAI)	all data available
2016/03/23	on board	Orbit Maintenance Maneuver (end : 2016/03/23 13:27:05 TAI)	all data available
2016/03/21	on board	Orbit Inclination Maneuver (end : 2016/03/21 11:20:43 TAI)	all data available
2016/03/07	on board	Orbit Inclination Maneuver (end : 2016/03/07 12:22:27 TAI)	all data available
2016/03/02	on board	Orbit Maintenance Maneuver (end : 2016/03/02 15:33:51 TAI)	all data available
2016/02/16	on board	Launch	no data available

References

AVISO link

<http://www.avis0.aifmetry.fr/en/missions/current-missions/sentinel-3.html>

nominal attitude law

not available

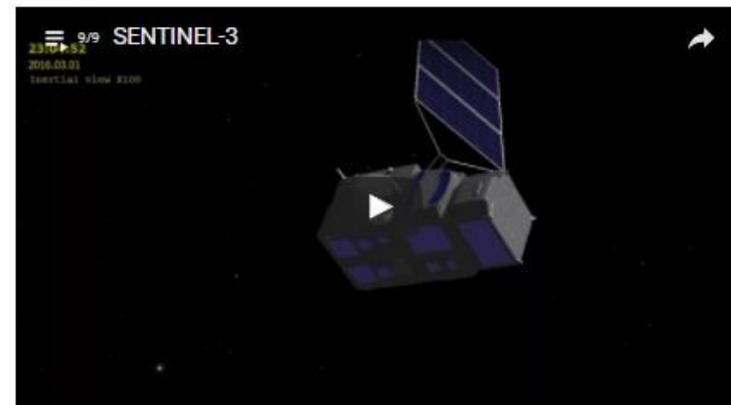
maneuver history

<ftp://ftp.ids-doris.org/pub/ids/satellites/s3aman.txt>

mass and gravity center history

<ftp://ftp.ids-doris.org/pub/ids/satellites/s3amass.txt>

Videos





Example: site page of Toulouse

TOULOUSE - FRANCE



Site news

Doris mails

- No 0805 different ID for Master Beacons
- No 0790 ITRF2008-DPOD2008 coordinates for all DORIS
- No 0504 Antenna change at Toulouse (France)
- No 0328 DORIS summary files available from [IGN/JPL Analysis Center](#)
- No 0047 Cycle 210
- No 0020 Master Beacon Moving at Toulouse (France)

Local events

Date	Acronym	Information provided
2015/04/17	TLSB	BEACON CHANGED
2015/04/17	TLSB	TRACKING OSCILLATOR CHANGED
2014/02/06	TLSB	TRACKING OSCILLATOR CHANGED
2013/12/04	TLSB	TRACKING OSCILLATOR CHANGED
2010/10/13	TLSB	potential perturbation on DORIS data (wrong meteorological data (humidity, temperature)) START
2007/07/04	TLSB	TLSB START - Antenna change
2007/07/03	TLHA	TLHA END
1997/08/12	TLHA	TLHA START

TOULOUSE DORIS site description form

0. Form

Prepared by : SIMB (DORIS installation and maintenance department)
 Date prepared : 29/01/2013
 Report type : UPDATE

Site logs

- TLSB20130129.LOG (current; see below)
- TLSB20120202.LOG
- TLSB200812.LOG
- TLSB200803.LOG
- TLHA200707.LOG
- TLHA200507.LOG
- TLHA200405.LOG

Other pictures

- TLSB.jpg
- TLSB-obstructions-2007-07-v1.jpg
- TLHA.jpg

Plots

- Time series of coordinates
- CNES POD MOE statistics
- CNES POD POE statistics

Map

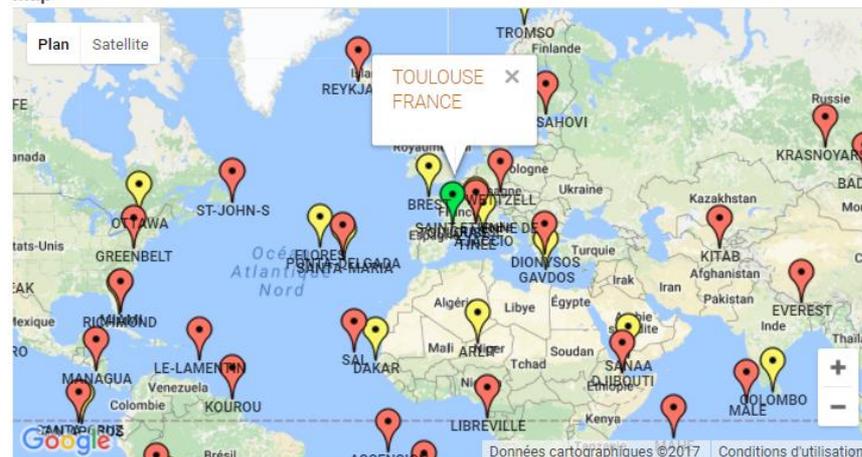




Table of events

1986

2017

Time line

ALL
 STATION
 SYSTEM
 EARTHQUAKE
 DATA

Date	Type	Element	Event	Source
2017/03/15 00:00:00	data	JASON-2	JASON-2 in safe hold mode from 2017/03/15 19:20:00 to 2017/03/29 14:50:00. No DORIS 2.2 data and no orbit for this period. RINEX files available during that period but with some gaps.	
2017/03/05 22:47:00	earthquake	[PORT-MORESBY] MOSB 51001S003	Magnitude:6.5 Distance:446km	USGS (NEW)
2017/03/04 00:00:00	station	[SOCORRO] SOFC 40503S006	SOFC START	dorismail 1068
2017/03/04 00:00:00	station	[SOCORRO] SOEB 40503S005	SOEB END	dorismail 1068
2017/03/03 00:00:00	station	[RIKITEA] RIMB 92301S004	BEACON CHANGED	dorisstations 0128
2017/02/23 09:40:54	system	SENTINEL-3A	[on board] Orbit Maintenance Maneuver (end : 2017/02/23 09:40:57 TAI), all data available	SSALTO
2017/02/15 13:30:00	system	JASON-3	[on board] Onboard GPS software reset. Less data from 2017/02/15 13:30:00 TAI to 2017/02/15 20:51:00 TAI, less data available	SSALTO
2017/02/07 14:07:36	system	CRYOSAT-2	[on board] Orbit Maintenance Maneuver (end : 2017/02/07 14:09:51 TAI), all data available	SSALTO
2017/01/29 23:14:13	system	JASON-2	[on board] Orbit Maintenance Maneuver (end : 2017/01/29 23:14:14 TAI), all data available	SSALTO
2017/01/26 00:00:00	data	SENTINEL-3A	Start delivering RINEX with DIODE time tagging and completion of missing periods (version number of the files: 001)	

Earthquake in vicinity of DORIS stations (mag. > 6; dist. < 500 km)
(Processing chain of USGS mails):

Station (beacon network events)

(Processing chain of formatted mails from « dorisstation / dorismail » mailing lists)

System (on board events)

From a text file updated by SSALTO Operation Center

Data (events impacting the data)

From a text file updated by the Central Bureau

IDS Webservice

Plot tools to:

- visualize time series
- download the time series and the graphs
- get statistics

A map to:

- visualize the DORIS network
- select sites to visualize time series or see the sitelog

Station position

Station position differences at observation epochs relative to a reference position (North, East and Up trended time series).

Combination parameters

Combination parameters i.e. outputs of the IDS Combination Center analysis (WRMS of station position residuals, scale and translation parameters, number of stations used in the analysis).

Earth Orientation Parameters

Earth Orientation Parameters from the IDS Combination Center analysis (X_p , Y_p , LOD).

Orbit residuals

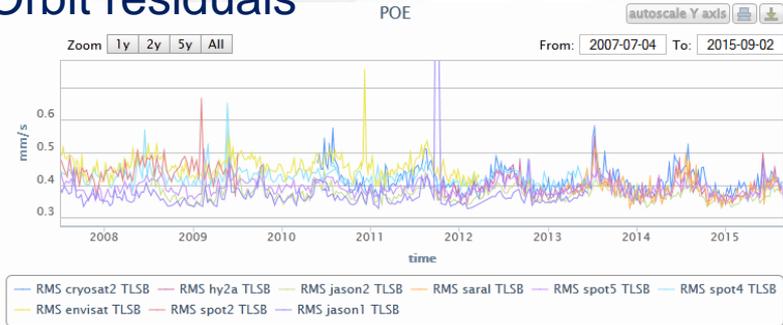
Orbit residuals and amount of station measurements from CNES Precise Orbit Ephemeris processing (RMS of post-fit orbit residuals, total and validated number of DORIS measurements per arc).

Network viewer

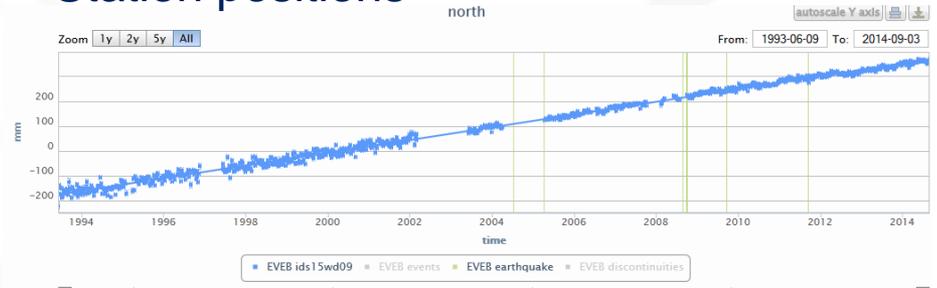
A network viewer to select sites. You can access to the **DORIS combined time series** from the IDS Combination Center and **GNSS combined time series at colocated sites** from the IGS TRF Combination Center.

The Plottools

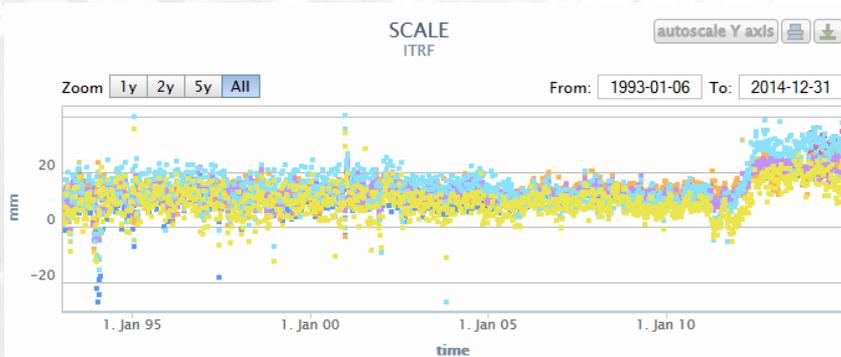
Orbit residuals



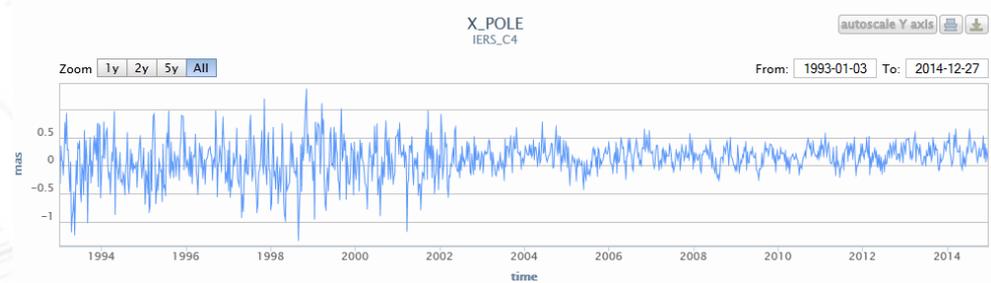
Station positions



Combination parameters



EOP



Services of the Plottools

data

HARTEBEESTHOEK : HBKA, HBKB, HBLA, HBMB, HBLB

DORIS stations		Series						
Name	Code	ids17wd05	esa17wd04	gop17wd03	grg17wd03	gsc17wd05	ign17wd05	ina17wd05
HARTEBEESTHOEK	HBKA	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
	HBKB	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
	HBLA	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
	HBMB	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
	HBLB	<input checked="" type="checkbox"/>	<input type="checkbox"/>					

View the site page

Download the entire time series (STCD file)



Export the graph as PNG
Export the data as CSV or XLS
Export a PDF report with graphs and statistics

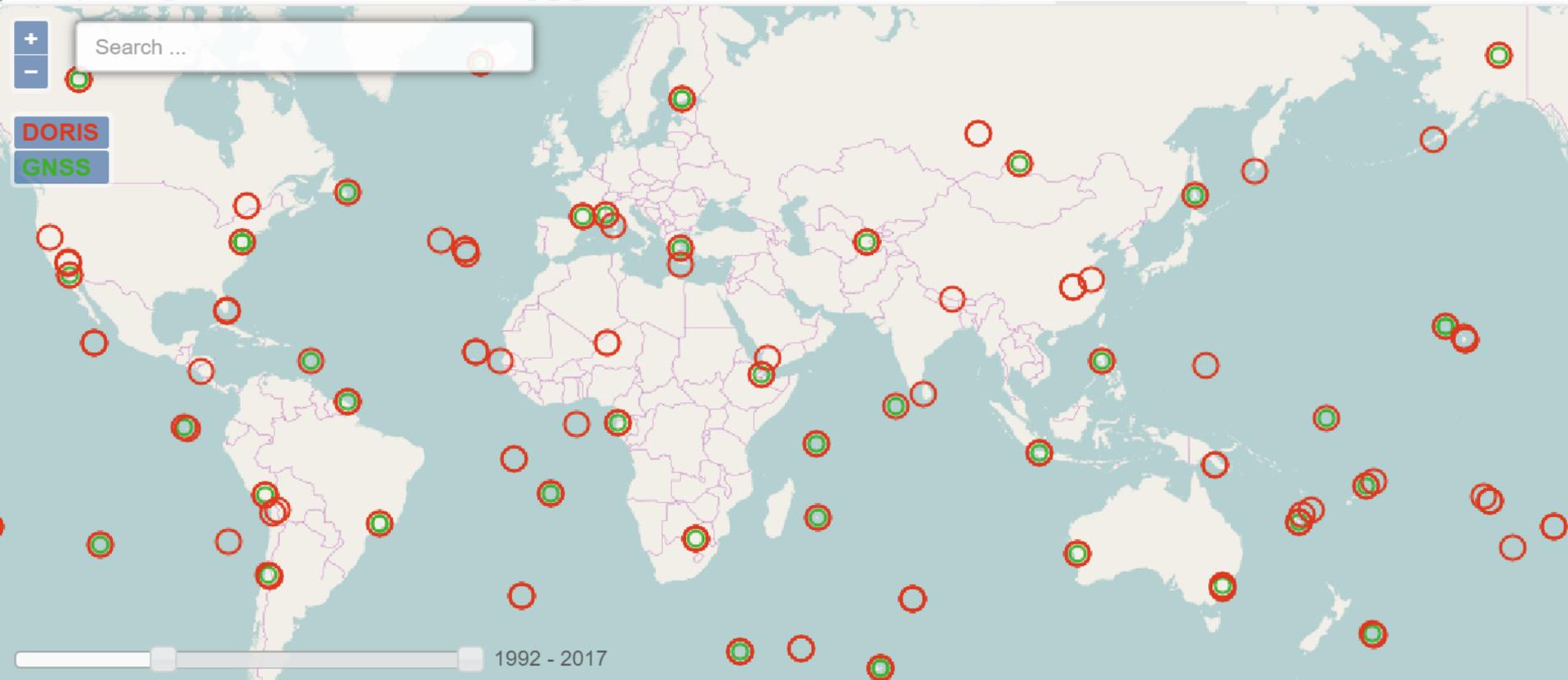
Statistics

	EAST	NORTH	UP
● HBKA ids17wd05	mean: -76.36 mm wrms: 24.51 mm slope: 20.84 mm/year start: 1993/01/06 end: 1997/05/21	mean: -92.21 mm wrms: 14.93 mm slope: 18.99 mm/year start: 1993/01/06 end: 1997/05/21	mean: 10.21 mm wrms: 18.93 mm slope: -5.57 mm/year start: 1993/01/06 end: 1997/05/21

Network viewer

📍 Network viewer

A network viewer to select sites. You can access to the **DORIS combined time series** from the IDS Combination Center and **GNSS combined time series at colocated sites** from the IGS TRF Combination Center.



Services of the network viewer

Station Position Orbit residuals Combination parameters Earth Orientation Parameters Network viewer

Search ...

TLSB
 technique : DORIS
 domes : 100035005
 installation : 2007-07-04 00:00:00
 latitude : 43.549611
 longitude : 1.484889
 altitude : 212.5
 country : FRANCE
 site : TOULOUSE
 siblings : TLSB (GNSS)

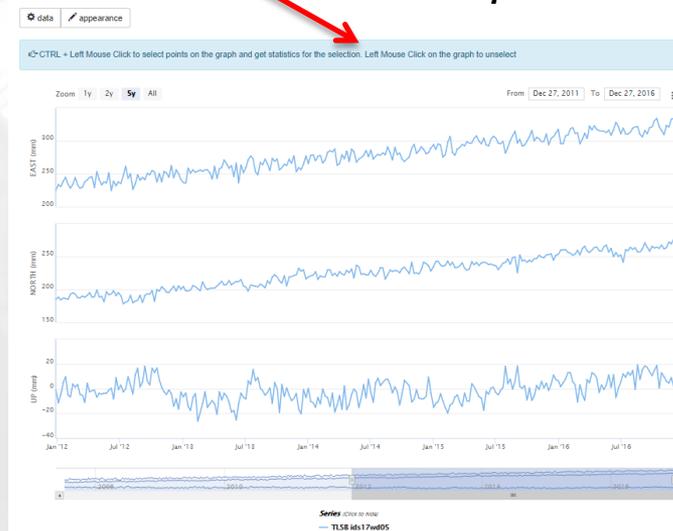
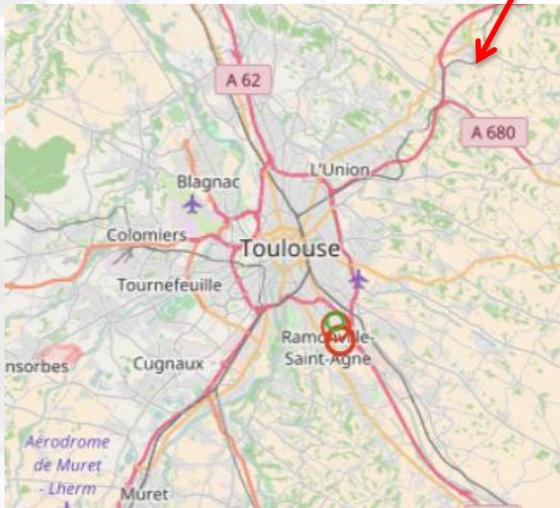
Center
 View log
 Trace position

https://apps.ids-doris.org/apps/stcdtool.html?station=137

« Center »

« View log »

« Trace position »



TOULOUSE - FRANCE



Site logs	Other pictures
FLS820130128.LOG (current seen before)	FLSB.jpg
FLS820130202.LOG	FLSB-obshudeni-201707-1.jpg
FLS8200812.LOG	FLSB.jpg
FLS8200803.LOG	
FLH8201707.LOG	
FLH8200809.LOG	
FLH820405.LOG	

Notes
 time series of coordinates
 CNES PCD MODE swatches
 CNES PCD POE swatches



Site news

Done mails

- No 0885 different ID for Master Seasons
- No 0790 ITRF2008-OP02008 coordinates for all DORIS
- No 0708 Antenna change at Toulouse (France)
- No 0328 DORIS summary files available from ION/3PL Analysis Center
- No 0847 Cycle 238
- No 0830 Master Season Moving at Toulouse (France)

Date	Acronym	Information provided
2015/04/17	FLSB	BEACON CHANGED
2015/04/17	FLSB	TRACKING OSCILLATOR CHANGED
2014/02/08	FLSB	TRACKING OSCILLATOR CHANGED
2013/12/04	FLSB	TRACKING OSCILLATOR CHANGED
2010/10/12	FLSB	possible perturbation on DORIS data (using meteorological data (humidity, temperature) STACT)
2007/02/04	FLSB	TLSB STACT - Antenna change

TOULOUSE DORIS site description form

B. Form

Prepared by : SIMB (DORIS installation and maintenance department)
 Date prepared : 25/02/2013
 Report type : UPDATE

DORIS/GNSS comparisons

data

Select a station from list...

DORIS

TOULOUSE : TLHA, TLSA, TLSB

GNSS

TOULOUSE : TLSE

DORIS stations		Series							
Name	Code	ids17wd05	esa17wd04	gop17wd03	grg17wd03	gsc17wd05	ign17wd05	ina17wd05	
TOULOUSE	TLHA	<input checked="" type="checkbox"/>	<input type="checkbox"/>						
	TLSA	<input checked="" type="checkbox"/>	<input type="checkbox"/>						
	TLSB	<input checked="" type="checkbox"/>	<input type="checkbox"/>						

GNSS stations		Series
Name	Code	igs17wp01
TOULOUSE	TLSE	<input checked="" type="checkbox"/>

The plottool for station position proposes the time series for the DORIS sites but also for the GNSS stations in co-location

DORIS: time series of the combined solution and of the ACs' solutions

GNSS: combined time series from IGS TRF CC
(→ processing chain to get and transform residual files from IGN)



Conclusion

- IDS proposes metadata and interoperable web applications to explore, visualize and download (some) data
- An API REST has been developed to request metadata through HTTP protocol
- NB: Vocabulary is not constrained to a commonly adopted thesaurus, interoperability is not based on OGC standards

Future plans

- Complete the database

DPOD (*planned*), Position residuals of the cumulative solution (*planned*), DORIS articles, sitelogs, meeting presentations, calendars ...

- Develop commands to get data from interoperable services (USGS, IAG services? others?)

- Set up a catalogue of metadata of the data and products

Objectives to be defined:

description in international standard? → ISO, Inspire

interoperability? → CSW

exploration? → Geonetwork tool

- Perspectives:

Adopt OGC standards for time series (Sensor Observation Service)

IDS metadata and web applications (soon?)



Interoperable webservice

« Standardized » Application Programming Interface (API)

automatic scripts

Data Base					
Event	Position Data	Satellite	Serie	Site	Station

Manual entries

USGS earthquakes

Other geodetic techniques + tide gauges ...