

# IDS webservices for sharing data and products

## What are DORIS and IDS?

**DORIS** (Doppler Orbitography and Radiopositioning Integrated by Satellite) is a **French satellite system** used for the **precise orbit determination of satellites**, especially for altimetric missions (Topex/Poseidon, Jason-1,-2,-3, Envisat, Cryosat-2, Saral, Sentinel-3, HY-2...). Knowing the satellite orbit with a high accuracy (~1cm) is crucial for monitoring the sea level variations from altimetry measurements.

In addition to its functions in orbitography, DORIS as a space surveyor is also a **terrestrial positioning system** that has found many applications in geodesy and geophysics.

The **International DORIS Service (IDS)** is a service of the **International Association of Geodesy (IAG)** created in 2003, to provide a support, through DORIS data and products, to geodetic, geophysical, and other research and operational activities, and to give access to data, derived products and informations related to the DORIS system. IDS contributes to the realization of the International Terrestrial Reference Frame (ITRF), and participates in the **Global Geodetic Observing System (GGOS)**.

## IDS web services

IDS has developed services for sharing data and products with the users. Metadata and interoperable web applications are proposed to explore, visualize and download the key products such as the position time series of the geodetic points materialized at the ground tracking stations. An API REST has been developed to request metadata through HTTP protocol.

Metadata and API are used:

- on the web site to generate tables, create pages, produce the kml file of the network for Google Earth.
- on the web service by the **plot tools** and the **network viewer**

Metadata 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:** name, country, latitude, longitude, 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**.

## New version of the network viewer (*online in May*)

The new version offers new features: plates boundaries, horizontal velocity vectors determined from DORIS measurements, Earthquakes mag.  $\geq 5$  and  $< 500$ kms from a DORIS site.



- DORIS:** DORIS sites since network deployment start
- GNSS:** IGS sites collocated with DORIS
- PLATES:** Plate boundaries from Bird, 2003
- VELOCITIES:** Velocity vectors from DPOD2014 solution
- EARTHQUAKES:** Earthquakes with a magnitude  $\geq 5$  around DORIS stations (USGS source)

Click on one site on the map and get more information

**EVEREST - NEPAL**

Site logs

Date	Information
1993/03/20	Information Earthquake of magnitude 6.2 distance 134km
2002/03/16	Information discontinuity in position
2004/07/11	Information Earthquake of magnitude 6.2 distance 430km
2004/10/13	Information Lack of data START
2005/02/14	Information Lack of data END

## Data about the Satellites

### Information

- List of the DORIS satellites
- Attributes (orbit parameters, launch date, Doris instrument generation, ...)
- Table of events

### Visualize the satellites

- videos of the DORIS-equipped satellites in orbit available on the IDS video channel
- Pictures

## Data about the Stations

### Information

- List of the stations
- Site logs
- News from DORISmail mailing list
- Table of events

### Visualize the network

- Kml file for Google Earth
- Map on the station page
- Network viewer

### Visualize the stations

- Pictures on the station page
- Photo gallery

## Products

### Visualize the time series

- Station positions (North, East, Up)
- Combination parameters (scale, geocenter)
- Earth Orientation Parameters
- Orbit residuals

**NEW** Position residuals of the cumulative solution

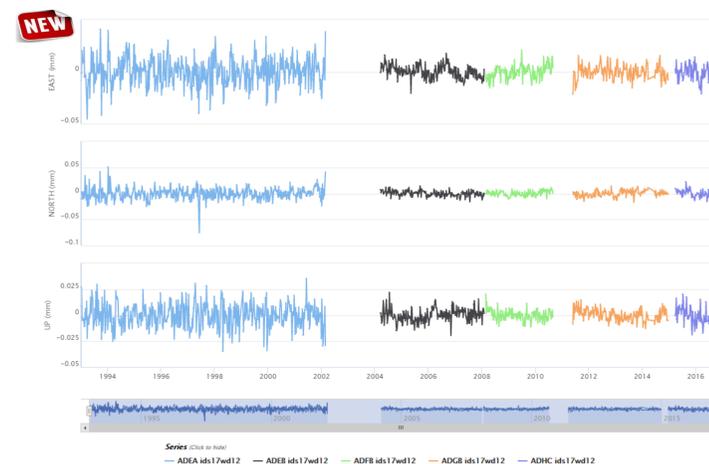
## The tools

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).
- NEW Position residuals**  
Position residuals of the cumulative solution from the IDS Combination Center analysis (North, East, Up)
- 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.

## A new plottool for position residuals (*online in May*)

A new plottool is proposed to plot the position residuals of the cumulative solution produced by the IDS Combination Center from the solutions of the Analysis Centers.



## Future plans

### Network viewer

- Vertical velocities
- Visibility circles
- Satellite ground tracks
- Tide gauges and other GGOS techniques in co-location

### Complete the database

- DPOD, sitelogs, DORIS articles, ...

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