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Development of web tools to disseminate space geodesy data-related products

L. Soudarin (CLS), P. Ferrage (CNES), A. Mezerette (AS+)

In order to promote space geodesy data-related products, the French Space Agency CNES with the support of CLS has developed a set of plot tools to interactively build and display time series of site positions, orbit residuals or terrestrial parameters (scale, geocenter). Theses tools have been implemented on one hand for the webservice of the IDS (International DORIS Service), and on the other hand on the website of GRGS (the French Space Geodesy Research Group).

This poster presents the tools available on IDS and GRGS websites, and gives an overview of their functionalities.

Station position time series from GRGS Analysis Centers

http://grgs.obs-mip.fr/

The time series that can be visualized with the plot tools are:
Station position differences at observation epochs relative to a reference position (North, East and Up trended time series)
They are provided:
-for **DORIS** by **CNES/CLS Analysis Center for IDS**
-for **GNSS** by **CNES/CLS Analysis Center for IDS**
-for **SLR** by **Observatoire de Paris /IMCCE** (available soon)
(Time series from Observatoire de Bordeaux expected for VLBI)

Visualize DORIS derived time series on the IDS webservice

http://ids-doris.org/webservice

The time series that can be visualized with the plot tools are:

DORIS station position differences at observation epochs relative to a reference position (North, East and Up trended time series)
-time series from the **Analysis Centers** (ESA (esa), Geodetic Obs. Pecny (GOP), CNES/CLS (grg), IGN (ign), INASAN (ina), NASA/GSFC (gsc)
-combined time series from the **IDS Combination Center** (ids)
In addition, **GNSS combined time series from the IGS TRF Combination Center** can be displayed **for sites in co-location** with DORIS.

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

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).

Additional data can also be displayed such as system events (stations, satellites, data) and Earthquake in the vicinity of the DORIS sites based on USGS Earthquakes notifications

The Tools

→a NETWORK VIEWER to select sites
→a family of PLOT TOOLS to visualize the time series

The plot tools allow users to:
→select charts to plot
→display time series
→edit data
→change plot appearance
→specify scaling
→download data, plots and graph statistics in several formats

The network viewer

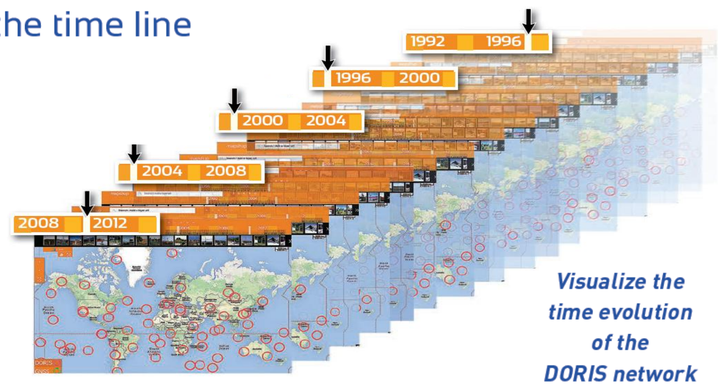
The interactive global map visualizes the DORIS sites and co-locations with other space geodetic techniques (only IGS GNSS sites for the moment).

From the map, the users can select sites and plot the available combined coordinates time series from IDS and/or IGS combination center.

They can also get access to site information.

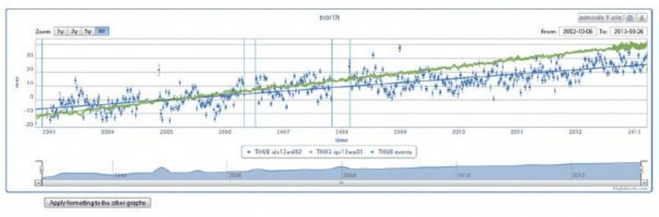
The time line at the top of the map can be used to display the network over time.

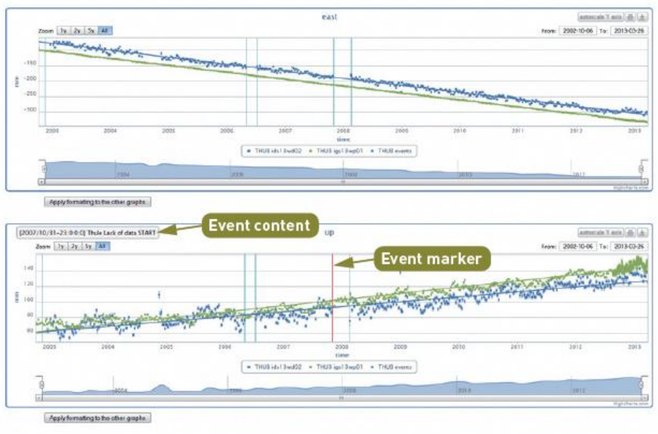
Using the time line



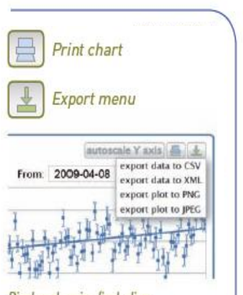
Visualize the time evolution of the DORIS network

Time series of station positions





Time series of the DORIS and GNSS stations in Thule (Greenland)

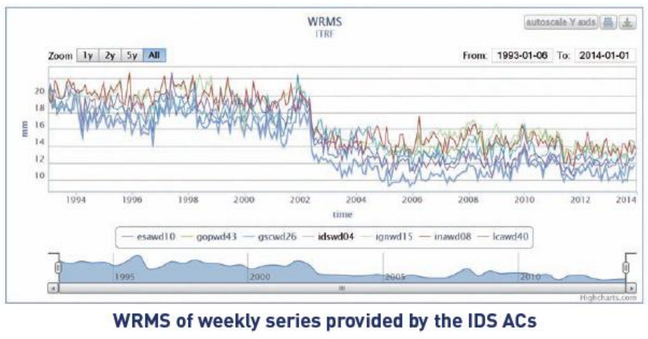


Displayed series (including modifications i.e. edited points, slope and/or biais added/removed) can be downloaded in CSV or XML formats. Each plot can be exported in PNG or JPEG format.

Combination parameters

The IDS Combination Center (CC) analyzes and combines sets of weekly solutions of station positions and EOP from the IDS Analysis Centers (ACs) to generate DORIS combined geodetic products. The IDS web service gives access to some outputs of the combination processing:

→ WRMS of station position residuals.
→ scale and translation parameters.
→ number of stations used in the analysis.



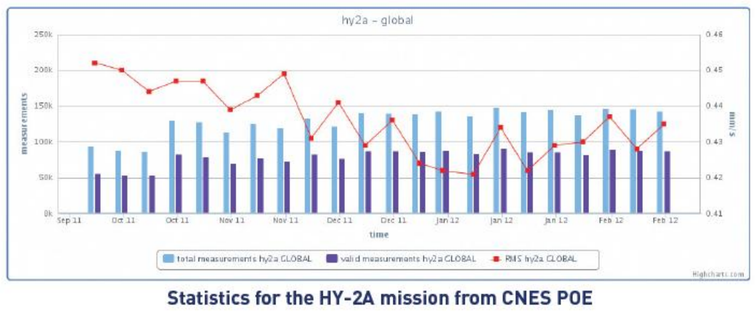
WRMS of weekly series provided by the IDS ACs

Orbit residuals

Complete the selection with station and satellite events

→ RMS residuals for DORIS in mm/s per arc (red dots).

→ number of DORIS measurements per arc: total (light blue columns) and validated (superimposed dark blue columns).



Statistics for the HY-2A mission from CNES POE

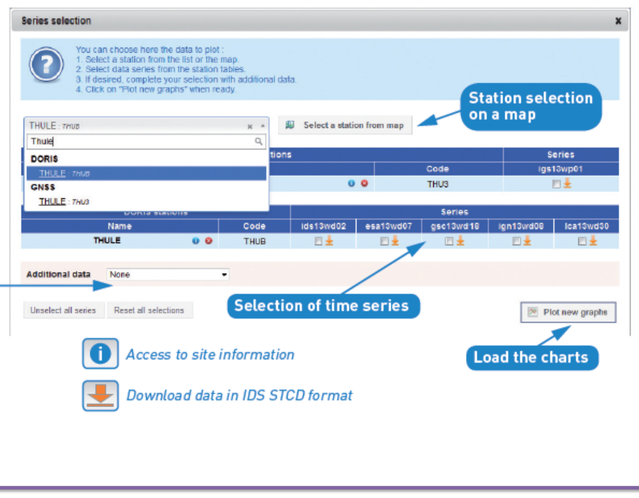
Site selection, data loading

Additional data

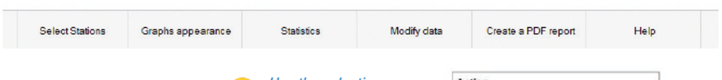
Complete the selection with station and satellite events

→ new sites, new antennas, removed sites, beacon failures, major recent earthquakes in vicinity (from USGS survey service).

→ events concerning DORIS onboard receivers, POE performances.



More with the menu bar



Besides the site selection, the menu bar proposes functions to:

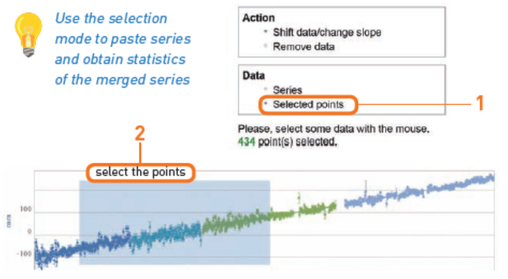
→ **tune the graph appearance**
Change color, line size and style, remove trend lines and error bars, choose the time scale.

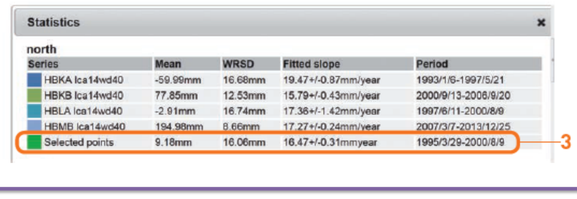
→ **get statistics for the plotted points**
They are refreshed each time the plots are modified (zoom, data removed, selection,...).

→ **modify data**
Shift, change slope, remove a series or a selection of points.

→ **get a report in PDF format**
It includes the North, East and Up plots, and the statistic table.

Use the selection mode to paste series and obtain statistics of the merged series





Technical details

→The network viewer is an interactive global map application called **Mapshup**.

→ Supported browsers: Firefox, Google Chrome, Safari, Internet Explorer 8+.