

3.4.4 International DORIS Service (IDS)

General The IDS website URL is <http://ids.cls.fr/html/about_ids.html>. The IDS Terms of Reference are available at <<http://ids.cls.fr/html/organization/tor.html>>. The present organization of the IDS is similar to that of the other technique-oriented services. It is described at <http://ids.cls.fr/html/report/Organization_IDS_030701.pdf>.

Network The DORIS permanent network is shown in Figure 1. Site logs are available at <<http://ids.cls.fr/html/doris/sitelog.html>>.

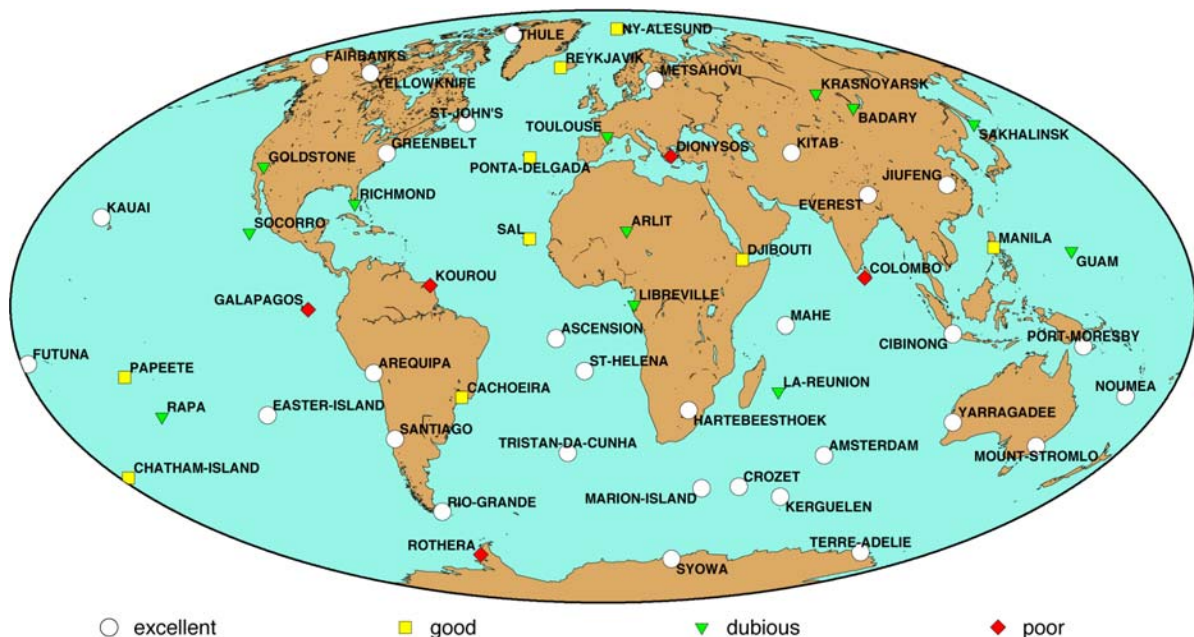


Fig. 1: The DORIS permanent stations and their estimated stability (January 2005)

The stations rejuvenation program initiated in 2000 was continued, as illustrated in Figure 2. In 2004 the following stations were renovated in order to improve the long-term stability of the antenna support:

- Mount Stromlo (Australia)
- Cachoeira Paulista (Brazil)
- Marion Island (South Africa)
- Badary (Russia)
- Yuzhno-Sakhalinsk (Russia)
- Reykjavik (Iceland)

This brings the total number of DORIS stations to 58. At the end of 2004, 41 out of 58 stations (in the permanent orbitography network) are considered to have good or excellent stability.

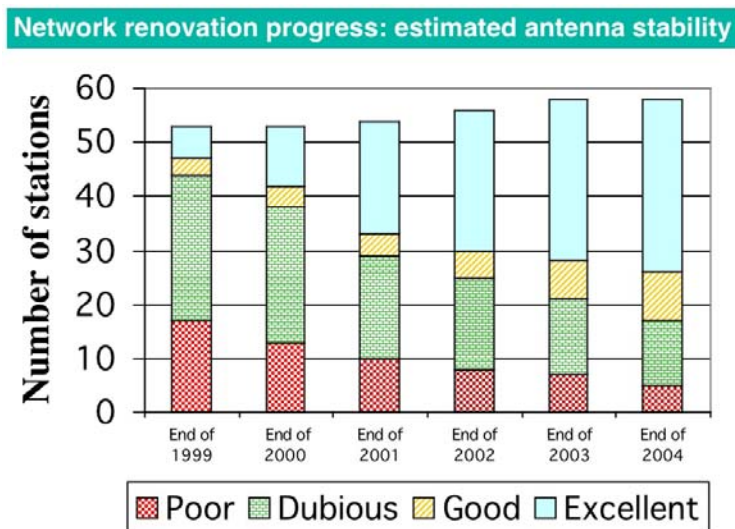


Figure 2: DORIS permanent network renovation

A new station was installed at Belgrano II, an Argentine base in Antarctica, following a joint proposal to the IDS by the Alfred Wegener Institute and the Instituto Antártico Argentino.

The status of co-locations with currently operating stations of the other techniques contributing to IERS is as follows.

- GPS : 33 sites
- SLR : 8 sites
- VLBI : 7 sites

The following new co-locations were made available in 2004:

- DORIS-SLR tie at Jiufeng measured in December 2003
- DORIS-GPS tie at Yuzhno-Sakhalinsk measured in August 2004
- DORIS-VLBI tie at St-John's measured in 2003

Observing satellites and data flow

Six DORIS-equipped satellites are used: Spot 2, 4 & 5, Topex/Poseidon, Jason 1 and Envisat, with altitudes ranging from 800 to 1300 km. The DORIS receiver on board Topex/Poseidon ceased operation at the end of October 2004, thus ending a more than 12-year service, far beyond the instrument and spacecraft nominal lifetime.

The observations are stored at the two IDS Data Centers (NASA/CDDIS: <<ftp://cddis.gsfc.nasa.gov/pub/doris/>>; IGN: <<ftp://lareg.ensg.ign.fr/pub/doris/>>). The organization of the Data Centers is described at <http://lareg.ensg.ign.fr/IDS/doc/struct_dc.html>.

Several analysis centers routinely analyze the data and provide their products to the data centers, under the SINEX format when applicable. Operational analysis centers are run at CNES/SOD, CNES/SSALTO, IGN-JPL, LEGOS-CLS, UT/CSR and INASAN. Other centers are providing partial results or are still in development: Geoscience Australia, IAA, VUGTK (Prag).

IDS products, contributions to IERS data analyses

As of January 2005, main IDS available products are as follows.

- weekly IGN-JPL time series of terrestrial reference frames (TRF) including daily polar motion contributed to the Combination Pilot Project;
- weekly IGN-JPL time series of station coordinates, TRF translation parameters (geocenter motion) and scale;
- IGN-JPL long-term cumulative solutions,
- monthly LEGOS-CLS time series of station coordinates.

LEGOS-CLS is preparing for the routine submission of weekly time series of terrestrial reference frames (TRF) including daily polar motion to contribute to the Combination Pilot Project.

Analysis Coordination

The Analysis Coordination tasks (<<http://lareg.ensg.ign.fr/IDS>>) are run jointly by the Analysis Coordinator at IGN/LAREG and the Central Bureau at CLS.

In the context of the DORIS Pilot Experiment, the Central Bureau had initiated in 2002 an Analysis Campaign that focused on time series of station coordinates derived from observations of the Spot 2, Spot 4 and Topex/Poseidon satellites. Five analysis centers participated: IGN-JPL, LEGOS-CLS, INASAN, CNES/SOD, CNES-CLS/SSALTO. The report of this Analysis Campaign is available at <http://lareg.ensg.ign.fr/IDS/events/2002_camp_report.pdf>.

Following the release of the first gravity field models derived from the GRACE mission in 2003, an analysis campaign was launched to study the impact of the gravity field model on the derived terrestrial and orbital reference frames, and to develop tools for the comparison, validation and combination of terrestrial reference frames. The final report of the campaign is available at <http://lareg.ensg.ign.fr/IDS/events/2003_camp_report.pdf>.

An Analysis Workshop took place in May 2004 in Paris. The discussion topics included operational issues, DORIS orbits and ionospheric parameters, analysis strategies, and reference frame and combination issues. See the contributions at <http://lareg.ensg.ign.fr/IDS/events/prog_2004.html>. This meeting provided an opportunity to intensify the technical discussions between the analysis centers.

Stability analyses of time series of station coordinates showed that the DORIS geodetic results are affected by white noise, while GPS time series are affected by flicker noise. This implies that the long term stability of the DORIS terrestrial reference frame results might be comparable to that of the other techniques.

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