

### 3.4.4 International DORIS Service (IDS)

**General** The International DORIS Service (IDS) officially started on July 1, 2003 as an IAG Service after the decision of the IAG Executive Committee at the IUGG General Assembly in Sapporo. 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](http://ids.cls.fr/html/report/Organization_IDS_030701.pdf). The IDS website URL is [http://ids.cls.fr/html/about\\_ids.html](http://ids.cls.fr/html/about_ids.html).

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

The following new stations have been added in 2003:

- Crozet (French Southern Indian Ocean territories),
- Jiufeng (China) which should replace Purple Mountain.



Fig. 1: Estimated stability of the DORIS permanent stations (January 2004)

In response to proposals submitted by candidate host agencies in the frame of the DORIS Pilot Experiment, the following stations were installed:

- Wettzell (Germany) from May 2003 to January 2004,
- Gavdos (radar altimeter calibration site in Crete), which may in the future replace Dionysos,

- Sorsdal (Glacier movement monitoring in Antarctica) from November 2003 to January 2004, following last year's experiment at the same site.

The stations rejuvenation program initiated in 2000 was continued, as illustrated in Figure 2. In 2003 the stations at Manila, Ascension, St-Helena, Ny-Alesund and Yaragadee were renovated in order to improve the long term stability of the antenna support. At the end of 2003, 37 out of 58 stations are considered of good or excellent stability.

Network renovation progress: estimated antennas stability

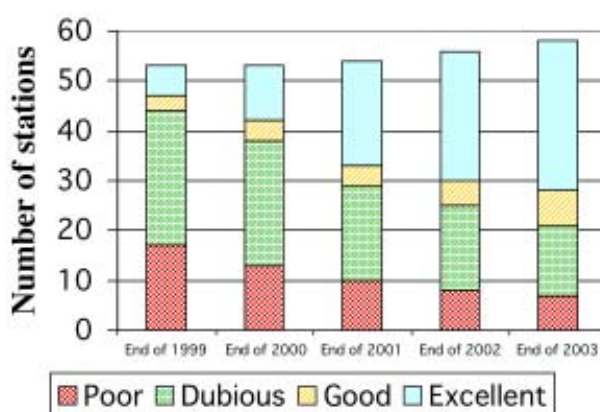


Fig. 2: DORIS permanent network renovation

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

- GPS : 32 sites
- SLR : 7 sites
- VLBI : 6 sites

According to the report of the IERS colocations workshop held in Matera in 2003, the local ties at a few sites need to be improved. On the other hand, it should be mentioned that the extension of the DORIS-VLBI colocations awaits the results of an investigation on the signal interferences issue.

### 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 observations are stored at the two IDS Data Centers (NASA/CDDIS: <ftp://cddisa.gsfc.nasa.gov/pub/doris>; IGN: <ftp://lareg.ensg.ign.fr/pub/doris>). The Data Centers organisation and IDS data flow were reorganized in 2003. See <http://lareg.ensg.ign.fr/IDS/doc/struct\_dc.html> for more details.

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Several analysis centers routinely analyse the data and provide their products to the data centers, under the Sinex format when applicable. The active analysis centers as of January 2004 are CNES/SOD, CNES/SSALTO, IGN-JPL, LEGOS-CLS, INASAN and UT/CSR. Other centers are planning to join IDS: Geoscience Australia, IAA, VUGTK (Prague).

**IDS products** The IDS products are listed in Table 1, together with the status of their availability and valorisation as of January 2004. The valorisation may take place within IDS, at the IERS product centers, or in the framework of space oceanography projects.

*Table 1. IDS products availability and valorisation*

Product	Availability	Comparison	Combination
Orbits	Yes	Yes	No
Global TRF SINEX	Yes	Yes	Yes
TRF-EOP SINEX time series	Yes	Yes	Yes
Time series of			
- station coordinates	Yes	Yes	No
- TRF origin	Yes	Yes	No
- EOP	Yes	Yes	Yes
- Ionosphere	Yes	No	No

**Analysis Coordination** In the context of the DORIS Pilot Experiment, the Central Bureau ran 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 data were collected under the form of time series of Sinex files with station coordinates. The analysis made use of the CATREF software (Z. Altamimi, P. Sillard, C. Boucher, 2002, JGRB, 107, 1029). The data were analysed in terms of series of coordinates of the origin and scale of the terrestrial reference frame, and the series of station residuals (available at <<ftp://ftp.cls.fr/pub/ids-cls/camp02>>). The analysis included also the detection of outliers and the investigation of breaks in the station histories. The report of the 2002 Analysis Campaign is available at <[http://lareg.ensg.ign.fr/IDS/events/2002\\_camp\\_report.pdf](http://lareg.ensg.ign.fr/IDS/events/2002_camp_report.pdf)>.

An analysis Workshop took place in February 2003 in Marne la Vallée. See the contributions at <[http://lareg.ensg.ign.fr/IDS/events/prog\\_2003.html](http://lareg.ensg.ign.fr/IDS/events/prog_2003.html)>. The conclusions of interest to IERS were as follows.

- Privileged topics for analysis
  - o Further develop TRF+EOP combination and unification
  - o Initiate 'geocenter'/TRF origin comparison & unification effort
- Inter-technique and IERS cooperation
  - o Identify a DORIS Core network
  - o Make more use of DORIS-SLR ground + space colocations
  - o Establish contacts with ILRS, IVS, IGS for network evolutions
  - o Consider colocations with SLR and VLBI in managing the evolution of the IDS network

A new Analysis campaign was started in the fall of 2003, with the aims to investigate the influence of the reference gravity field on the derived terrestrial reference frames, and also to further develop the intra-technique combination capabilities.

For general information on Analysis Coordination see <http://lareg.ensg.ign.fr/IDS/index.html>.

### Summary

The IDS is now officially in existence, in continuation of the DORIS Pilot Experiment. It makes use of six equipped satellites, permanently observed by over 50 well distributed stations. The 2003 highlights include the renovation of a number of stations, reorganisation of the Data Centers, and new developments in the coordination of analyses. While the Analysis Centers continue their support to IERS, the Analysis Coordinator and the Central Bureau are jointly developing comparison and combination activities that eventually aim at benefiting to the IERS Combination Pilot project.

*Hervé Fagard, Martine Feissel-Vernier*