The future International DORIS Service

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SUMMARY

- Organization: Steering Committee, Central Bureau
- Satellites
- Data: data flow coordination, data centers
- Analysis: analysis coordination, analysis campaign
- Stations: stations selection group, network evolutions
- Workshops: Toulouse, Biarritz, Marne la Vallée

from the DORIS Pilot Experiment to the IDS candidature
Steering Committee

➨ Gilles Tavernier  CNES  Gilles.Tavernier@cnes.fr  
  Chairperson

➨ Martine Feissel  Paris Observatory and IGN  feissel@ensg.ign.fr  
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➨ Pascal Willis  IGN JPL  Pascal.R.Willis@jpl.nasa.gov  
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  Stations Selection Group Chairperson
Central Bureau

➢ CNES/IGN/CLS

- Gilles Tavernier, Jean-Pierre Granier
- Laurent Soudarin, Jean-Jacques Valette
- Pascal Willis, Hervé Fagard

➢ Website: http://ids.cls.fr
## Satellites

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<th>Satellite</th>
<th>Application(s)</th>
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<td></td>
<td>2nd generation receiver</td>
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**DORIS applications**

- Orbit determination
- Gravity field
- Earth rotation
- Localization
- On-board real time orbit
- TAI
- Time-tagging

- December 7, 2001: JASON1
- March 1, 2002: ENVISAT1
- May 4, 2002: SPOT5
- CRYOSAT
- JASON2
- PLEIADES
Data flow coordination

➤ Carey Noll  NASA GSFC  USA
   • new satellites: Jason, ENVISAT, SPOT 5
   • first products: stations coordinates, EOP, geocenter, orbits

➤ Data Centers :
   • NASA GSFC CDDIS - USA
     ✦ ftp://cddisa.gsfc.nasa.gov/pub/doris
   • IGN
     ✦ ftp://lareg.ensg.ign.fr/pub/doris
DORIS Data delivery

- SPOT 2 (03/31/90 to 07/04/90, 02/01/92 to 03/22/92, since 10/16/92)
  - arc 440: 02/01/03 to 02/10/03 (04/03/03: T + 8 weeks)

- SPOT 3 (02/01/94 to 11/09/96)

- TOPEX (since 09/25/92)
  - cycle 386: 03/07/03 to 03/17/03 (03/31/03: T + 2 weeks)

- SPOT 4 (since 05/01/98)
  - arc 214: 02/08/03 to 02/15/03 (03/27/03: T + 6 weeks)

- JASON (since 01/15/02)
  - cycle 39: 01/28/03 to 02/06/03 (04/04/03: T + 8 weeks)

- SPOT 5 (since 06/11/02)
  - arc 29: 02/11/03 to 02/19/03 (04/03/03: T + 6 weeks)

- ENVISAT (since 06/18/02)
  - arc 30: 01/07/03 to 01/13/03 (03/18/03: T + 9 weeks)
DORIS Iono/Raw Data delivery

- **SPOT 2**
  - 10/28/02 to 12/29/02 and 03/03/03 to 03/16/03 (04/01/03: T + 16 days)

- **TOPEX**
  - 01/01/02 to 02/09/03 and 03/03/03 to 03/16/03 (04/01/03: T + 16 days)

- **SPOT 4**
  - 01/01/02 to 02/15/03 and 03/03/03 to 03/16/03 (04/01/03: T + 16 days)

- **JASON**
  - 08/19/02 to 02/16/03 and 03/03/03 to 03/16/03 (04/01/03: T + 16 days)

- **SPOT 5**
  - 05/04/02 to 02/16/03 and 03/03/03 to 03/15/03 (04/01/03: T + 17 days)

- **ENVISAT** (soon)
Analysis coordination

➔ Martine Feissel-Vernier  Paris Observatory and IGN  France

➔ Analysis campaign

● Sets of station coordinates
  ✦ time series
  ✦ global solutions

● Satellite orbits

● EOP time series

● Geocenter time series

➔ http://lareg.ensg.ign.fr/IDS/
Analysis campaign

- **CNES/SSALTO**
  - station coordinates (sinex time series): M, W

- **IGN/JPL**
  - station coordinates (sinex time series): M, W
  - station coordinates (sinex global)
  - EOP
  - Geocenter

- **INASAN**
  - station coordinates (sinex time series): M, W

- **LEGOS-GRGS/CLS**
  - station coordinates (sinex time series): M
  - orbits (Jason)
Other Analysis Centers

- CSR/UTEX
- IAA
- ESA/ESOC
- NASA/GSFC-Raytheon
- The Delft University of Technology
- Geoscience Australia
- The Royal Observatory of Belgium
- University of Berne
- Czech Technical University in Prague
### Stations Selection Group

- **Frank Lemoine**, GSFC, USA [Chairperson]
- **Eric Calais**, CNRS, France
- **Chuck DeMets**, University of Wisconsin, USA
- **Hervé Fagard**, IGN, France
- **Ramesh Govind**, AUSLIG, Australia
- **Bruce Haines**, JPL, USA
- **Kristine Larson**, University of Colorado, USA
- **Simon Williams**, Proudman Ocean. Lab., UK
Stations Selection Group

Site criteria
- International Space Geodetic and Gravimetric Network (ISGN)
- DORIS site constraints

Selection
- glacier: Sorsdal, Lambert (Geoscience Australia, Antarctica)
- geodesy: Wetzell/TIGO (Bundesamt für Kartographie und Geodäsie, Chile)
- altimeter calibration: GAVDOS (TU Crete)
- altimeter calibration: BURNIE (Geoscience Australia, Banks strait)

http://phys-geophys.colorado.edu/~kristine/doris.html
DORIS Network
Evolution prospects: objectives

➤ The long term stability of the antennas
  (stations renovation action)

➤ The global coverage
  (a few more stations to fill in the remaining “holes”
  + DORIS Pilot Experiment proposals)

➤ The equipment’s reliability
  (deployment of a new generation of beacons)
DORIS Network
Network renovation progress

- Number of stations
- Poor, Dubious, Good, Excellent

EGS-AGU-EUG Joint Assembly
Nice, France, 6 - 11 April 2003
Network: latest news

➨ Two new stations installed at the end of 2002:
  ● Thule (Greenland)
  ● Sal (Cape Verde), replacing Dakar

➨ Theoretical orbit coverage (when all stations are operating):
  ● “Low” satellites (SPOT-2, 4, 5 & Envisat) : 88 %
  ● “High” satellites (Topex & Jason): 98 %

➨ Stations renovated in 2002:
  ● Tristan da Cunha, Terre Adélie, Port Moresby, Kauai

➨ Stations renovated in 2003:
  ● Manila, St Helena, Ascension

➨ Mount Stromlo destroyed by fire in January; should be rebuilt by mid-2003
DORIS Network
Third generation beacons

- Main new features:
  - Possible frequency shift, avoiding jamming by nearby stations
  - Higher transmitted power
  - Modulated 2 GHz channel
  - Unambiguous internal International Atomic Time

- Installation progress:
  - Toulouse Master beacon (December 2001)
  - Tristan Da Cunha (January 2002)
  - Cibinong, Easter Island, Mahe, Terre Adélie, Thule, Kauai, Sal, Manila, Saint Helena
  - Kourou, HBK Master beacons (soon)
A new Master Beacon

Visibilités TOULOUSE, KOUROU, HARTEBEESTHOEK pour JASON (site mini 12 deg)
Avec 2 traces d'orbites consécutives, 1 minute entre 2 points
IDS Workshops

➤ Toulouse, France, May 2-3, 2000
  ● DORIS program, system performances and evolutions
  ● Products
  ● International DORIS Service

➤ Biarritz, France, June 13-14, 2002
  ● DORIS Pilot Experiment - IDS, Orbits and related products
  ● DORIS analysis results, IDS analysis campaign
  ● Analysis workshop, Network workshop
IDS Workshops

⇒ Marne La Vallée, France, February 20-21, 2003
  ● DORIS project, network, data, analysis strategies, Orbits, ionospheric sounding,
  ● Comparison/combination of DORIS products, the future IDS, the working connection with IERS

⇒ Next Analysis Workshop: September 2003 ?
IDS candidature

⇒ IUGG, Birmingham, Great Britain, 19-30 July 1999
   ● DORIS Pilot Experiment

⇒ September 1999
   ● call for participation

⇒ Steering Committee, Central Bureau, Data, Analysis, Stations, Workshops

⇒ IUGG, Sapporo, Japan, June 30 - July 11, 2003
   ● International DORIS Service Candidature