Doris network status and future missions

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## 2. DORIS NETWORK EVENTS 2012

<table>
<thead>
<tr>
<th>Year</th>
<th>Station</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>January</td>
<td>All</td>
<td>New coordinate and velocity set (DPOD/ITRF2008)</td>
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</tbody>
</table>
| February | Rikitea Sal – Réunion - Kitab | Beacon replacement  
|          |                          | Remote control system installation                                                       |
| March   | All                      | New set of site logs (major data updating and revision)                                    |
|          | Reykjavik                | Beacon replacement                                                                        |
|          | French West Indies       | Reconnaissance in Guadeloupe and Martinique (IGS colocation)                               |
|          | Rio Grande               | Antenna replacement (position unchanged)                                                  |
| April   | Futuna                   | Major renovation + local tie survey (new GNSS station ‘FTNA’)                             |
|          | Terre Adélie             | Equipment upgrade (3.1) + Maser and antenna replacement                                   |
| May     | Greenbelt                | Renovation (antenna raising and equipment replacement)                                     |
|          | Everest                  | Remote control system installation                                                       |
| June    | Tristan Da Cunha         | Major renovation + local tie survey                                                       |
|          | Metsähovi                | Renovation + local tie survey (new REGINA station)                                        |
| August  | Port Moresby             | Renovation (antenna raising and equipment replacement)                                     |
| September | Djibouti                | Beacon replacement + remote control system                                                |
| October | Jiufeng                  | Renovation + local tie survey (new REGINA station)                                        |
| December | Mahé                     | Antenna moving (40m) Beacon 3.2                                                          |
2. NETWORK AVAILABILITY

Current status of the 57 stations

Out of Order for over a year:

Yuzhno-Sakhalinsk (11/2005), Santa Cruz (06/2009), Socorro (10/2009), Monument Peak (02/2010)
2. NETWORK AVAILABILITY

- RESULT OF THE JOINT EFFORT OF CNES AND IGN
- 28 BEACONS OUT OF 56 REPLACED IN 3 YEARS
2. NETWORK EVOLUTION

- **SHORT RUN (NEXT 6 MONTHS)**
  - Mahé: antenna moving, local tie survey (new GNSS station)
  - St John’s: major renovation

- **LATER**
  - Chatham: station moving (host agency office move in June)
  - Goldstone: new station in place of Monument Peak
  - Miami: definitive shutdown (interferences with TV-mobile)
  - Hokkaïdo: new station in place of Sakhalinsk, co-location GNSS+VLBI
  - Major renovations: Socorro, Kitab, Easter

- **4th generation beacons**
  - maintain in operational conditions of the Network until at least 2025
  - study started, development 2014 - 2015
  - deployment from 2016
2. NETWORK DENSIFICATION

- NEW STATIONS
  - Fr. West Indies: installation planned in early 2013
  - Chichijima: installation planned in 2013
  - Nicaragua: under negotiation, co-location GNSS
  - Korea: under negotiation with KASI, co-location GNSS+SLR+VLBI
  - Wake island (Marshall): under consideration
2. REGINA PROJECT

“RÉSEAU GNSS POUR L’IGS ET LA NAVIGATION”

- Global network of over 30 stations, based on DORIS network, well distributed
- Project launched by CNES with the support of IGN
- Main objectives:
  - Global multi-GNSS real-time network:
  - Positioning: real-time determination of orbits and clocks
  - Contribution to: IGS, EUREF, ITRF

REGINA AND DORIS

- Contribution to ITRF: co-location GNSS/DORIS
- Improvement of the local tie survey accuracy
- Opportunity to strengthen contacts with host agencies
2. NETWORK DENSIFICATION

DORIS stations co-located with other IERS techniques (VLBI, SLR or GNSS)

REGINA GNSS co-location contribution (end of 2014)
RFI issues with DORIS

- Status presented in IDS workshop, Venise, September 2012:

- Preliminary Conclusions:

  - with Geodetic techniques:
    - GNSS: **no interference with GPS**, to be confirmed with Galileo TM stations
    - SLR : no interference
    - VLBI : **no interference**: thanks to IVS and VLBI teams, the problem is solved at Yarragadee, Syowa and Badary:

  - VLBI2010 : **risk of interference**, DORIS/VLBI2010 RFI studies are underway at Greenbelt/GGAO .

  - With other systems:
    - **No interference** with ARGOS and SVOM
    - **RFI** with radio-sounding system but recommendation easy to implement
DORIS current missions: 6 in orbit

- HY2-A (CNSA, NSOAS): 960km, 99°  August 2011 → mid 2014 (DGXX+LRA+GPS)
- CRYOSAT-2 (ESA): 717 km, 92°  April 2010 → end 2013 (DGXX + LRA)
- JASON2 (NASA/CNES): 1336 km, 66°  June 2008 → 2013 (DGXX+LRA+GPS)
- SPOT5 (CNES): 830 km, 98°  May 2002 → 2015 (DGM)
- JASON1 (NASA/CNES): 1336 km, 66°  Dec 2001 → 2013 (DGM+LRA+GPS)
- SPOT4 (CNES): 830 km, 98°  March 98 → mid 2013 (D1G)
Future DORIS missions

- **SARAL/ALTI-KA (ISRO)**: 800km, 98.5°  
  * February 2013 (5 years),

- **SENTINEL3A (GMES)**: 814km, 98.6°  
  - Sentinel 3B:  
    * mid 2014, (7.5 years + 5) 2017

- **JASON-3 (Eumetsat/NOAA/NASA/CNES)**: 1336 km, 66°  
  * mid 2014 (5 years)

- **HY2B C*, D ***:  
  * 2014, 2016, 2018 (3 years)

- **JASON-CS* (Eumetsat/NOAA)**: 1336 km, 66°  
  - Jason-CS (B):  
    * 2017 (7 years) 2023 (7 years)

- **SWOT* (NASA/CNES)**: 970km, 78°  
  * 2020 (3 years)

* Mission pending approval
DORIS missions

Past missions
Current missions, agreed life time
Future missions, nominal life time
Future missions pending approval

90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20

SPOT2  D1G
Topex/Poseidon  D1G, SLR, GPS
SPOT3

SPOT4  D1G
Jason-1  DGM, SLR, GPS
Envisat  D2G, SLR
SPOT5  DGM

Jason-2  DGXX, SLR, GPS
CryoSat-2  DGXX, SLR

HY-2A  DGXX, SLR, GPS
HY-2B  HY-2C, 2D
HY-2D

Saral  DGXX, SLR
Sentinel-3A  DGXX-S, SLR, GPS
Sentinel 3B...

Jason3  DGXX-S, SLR, GPS
Swot  DGXX-S, SLR, GPS
Jason CS  DGXX-S, SLR, GPS