IDS Report

GGOS Bureau for Networks and Observations
Vienna, 11 April 2018

Doppler
Orbitography
and **R**adiopositioning
Integrated
by **S**atellite

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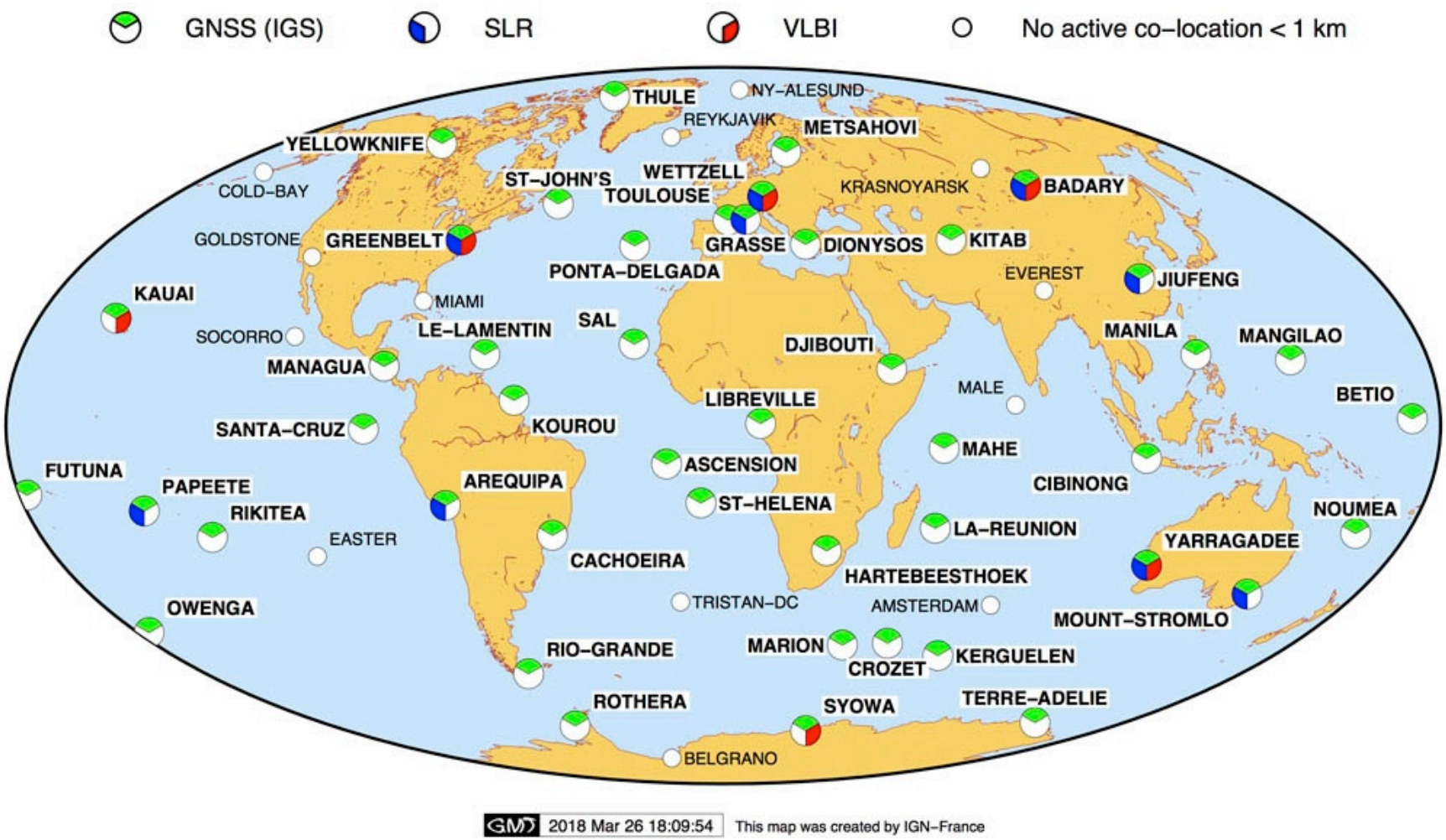
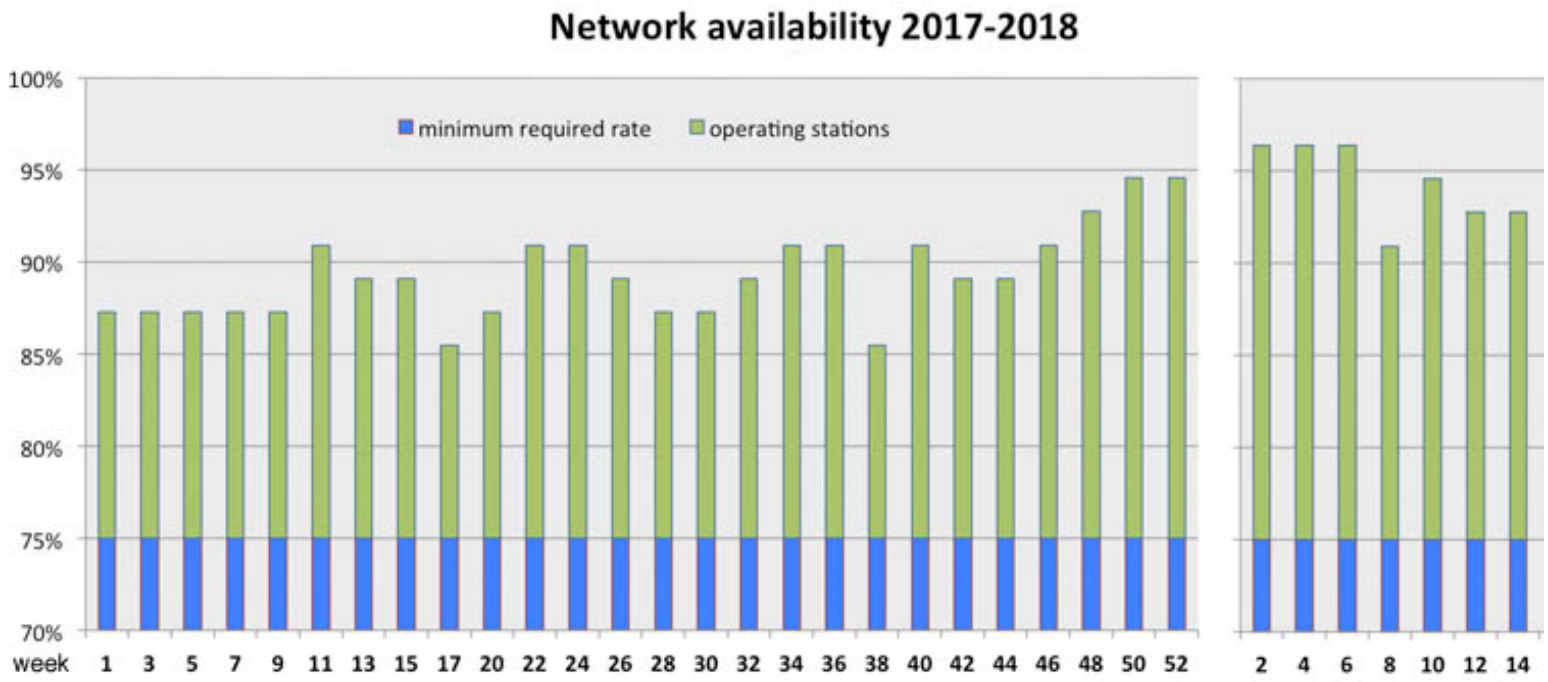
NETWORK STATUS

- 46 CO-LOCATIONS OUT OF 58 DORIS SITES



NETWORK STATUS

- RELIABLE SERVICE OF THE PERMANENT TRACKING STATIONS
- COVERAGE GAP IN SOUTH PACIFIC (3 STATIONS OUT OF ORDER)



NETWORK EVOLUTION

RECENT NETWORK EVENTS

- Dec. 2017: restarting at Cibinong, ID, a year after being out of active service (beacon replacement)
- Feb. 2018: relocating at Rothera, Antarctic (70m away - site refurbishment)
- Apr. 2018: new station at Mangilao, Guam Island (to near IGS station, GUUG)

SHORT TERM (2018):

- San Juan, AR: new station installing in place of Santiago (**3 techniques site**)
- Ny-Ålesund, Spitzberg, Norway: relocating (new **4 techniques site**)
- Easter Island, Chile: relocating (hosting migration)

LONGER TERM:

- Katherine, AS: new station installing in place of Port-Moresby (**3 techniques site**)
- Changchun, CN: new station installing in place of Sakhalinsk (**3 techniques site**)
- Reykjavik, IS: relocating to improve performance
- Papenoo, Tahiti, FR: new **4 techniques site**

4TH GENERATION DORIS GROUND BEACON

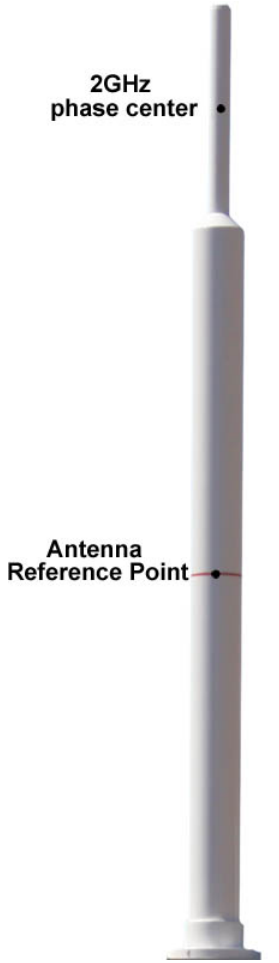
- Prototype currently in testing phase. Deployment is scheduled from mid 2019.

CURRENT NETWORK COMPONENTS

- **DORIS GROUND ANTENNAS STAREC B OR C:**
  - Same physical appearance but C type has consolidated specifications

- **13 STATIONS EQUIPPED WITH STAREC C:**
  - ADHC, GONC, JIWC, KEVC, KIVC, MLAC, MNAC, OWFC, PDOC, ROXC, SARC, SOFC, WEUC
  - No systematic deployment but replacements are performed after any maintenance operation
  - 2 mm uncertainty in the horizontal plane; 2.5 mm for the vertical component

- **45 STATIONS EQUIPPED WITH STAREC B:**
  - Before September 2014
  - Standard uncertainty of the 2GHz phase center in the vertical direction is 5 mm (vs. 1 mm)



DORIS / VLBI RF COMPATIBILITY

SPECIFICATIONS BASED ON SUCCESSIVE RF COMPATIBILITY TESTS:

- Greenbelt, MD USA (2014)
- Wettzell, Germany (2015-2016)
- Papenoo, French Polynesia (2017)

FINDINGS:

- The maximum level limit of the DORIS signal (2.036 GHz) allowed at the VLBI antenna input must be considered (commonly -60dBm)
- The minimum distance between DORIS and VLBI antennas shall be 300m
- Natural barrier, building, or RF shield providing total obstruction between the DORIS and VLBI antennas is highly recommended to contribute to the RF interference mitigation
- It is best to have height difference between the two antennas with DORIS above VLBI as DORIS signal is lower at low elevation.
- A specific study taking into account all the VLBI characteristics and the layout of the site is required and RF compatibility tests in real conditions are highly recommended.
- These requirements and precautions do not guarantee full compatibility of both systems. Other phenomena (reflection and diffraction of the DORIS signal, insufficient attenuation of the barrier) may modify the level of the signal received at the VLBI antenna input.

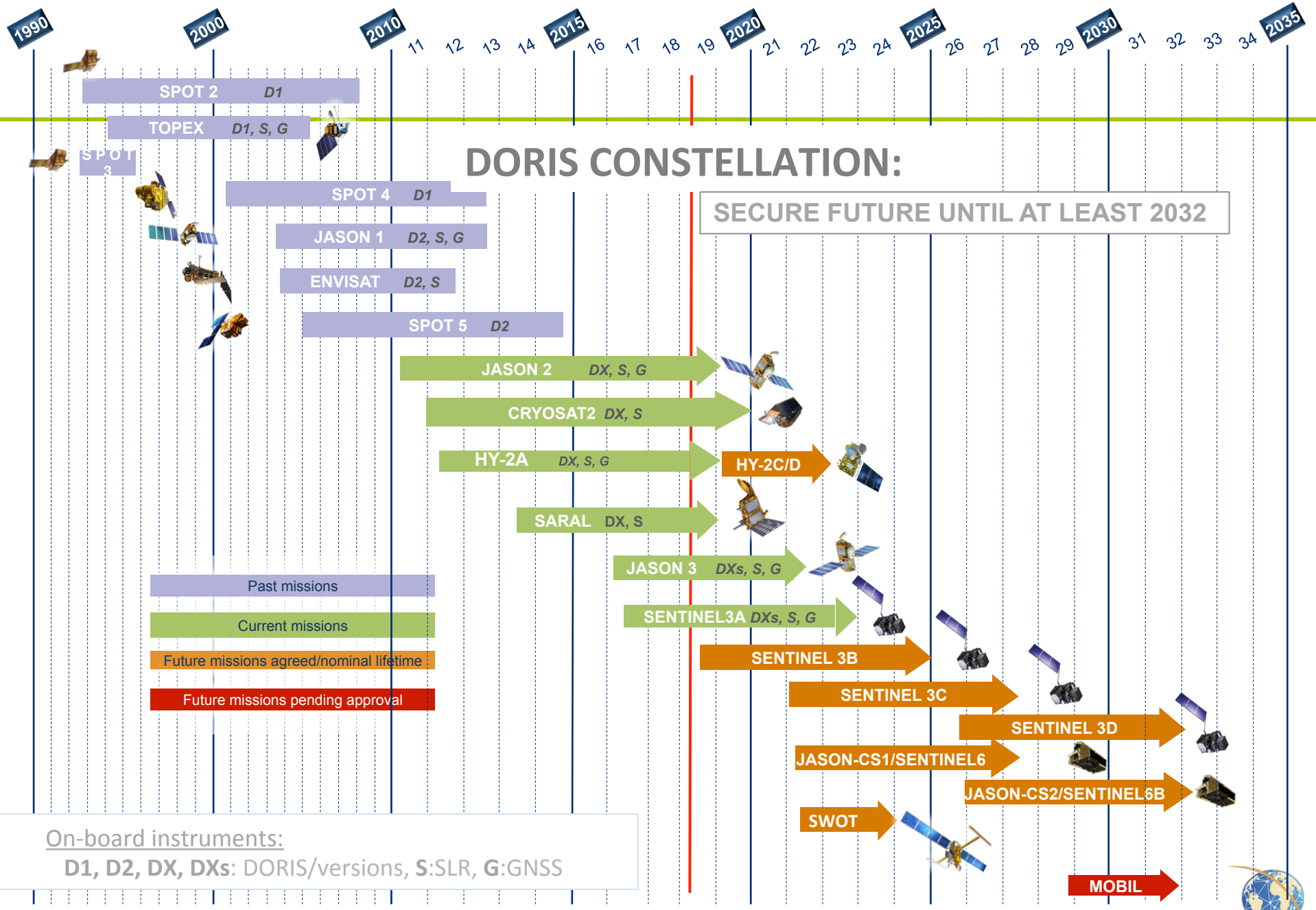
INCLUDED IN THE DORIS SYSTEM REQUIREMENTS DOCUMENT 2.1

DORIS STATIONS POSITIONS

- **DPOD2014**
  - DORIS extension of the ITRF for Precise Orbit Determination
  - Now released twice a year and based on the latest DORIS position and velocity cumulative solution. Version 2.0 is available in SINEX and text format
- **SUCCESSIVE ANTENNA LOCATIONS ON THE SAME SITE**
  - All available (since 1992) tie vectors are compiled in a text file: ftp://doris.ign.fr/pub/doris/cb_mirror/stations/DORIS_int_ties.txt or CDDIS server
  - This file has recently been enriched and updated
- **DORIS TIES VECTORS AT CO-LOCATED SITES**
  - All available tie vectors with instruments identification, co-location dates, site survey date and precision
  - File available on ftp://doris.ign.fr/pub/doris/cb_mirror/stations/DORIS_ext_ties.txt or CDDIS server

DORIS CONSTELLATION:

SECURE FUTURE UNTIL AT LEAST 2032



On-board instruments:

D1, D2, DX, DXs: DORIS/versions, **S**:SLR, **G**:GNSS

IDS NEWS

- **IDS COMMUNICATION**
  - IDS website (including web-services): http://ids-doris.org
  - IDS Activity Report 2017 under preparation
  - IDS Newsletter #5 under preparation
- **IDS RETREAT**
  - 13-15 June 2018, Caussens, France
  - Define the activities of the service for the next decade
- **NEXT IDS MEETINGS**
  - IDS AWG in Toulouse 11 June 2018
  - IDS Workshop in Ponta Delgada, Azores (Portugal) during the symposium "25 years of Progress in Radar Altimetry" 24-29 September 2018