

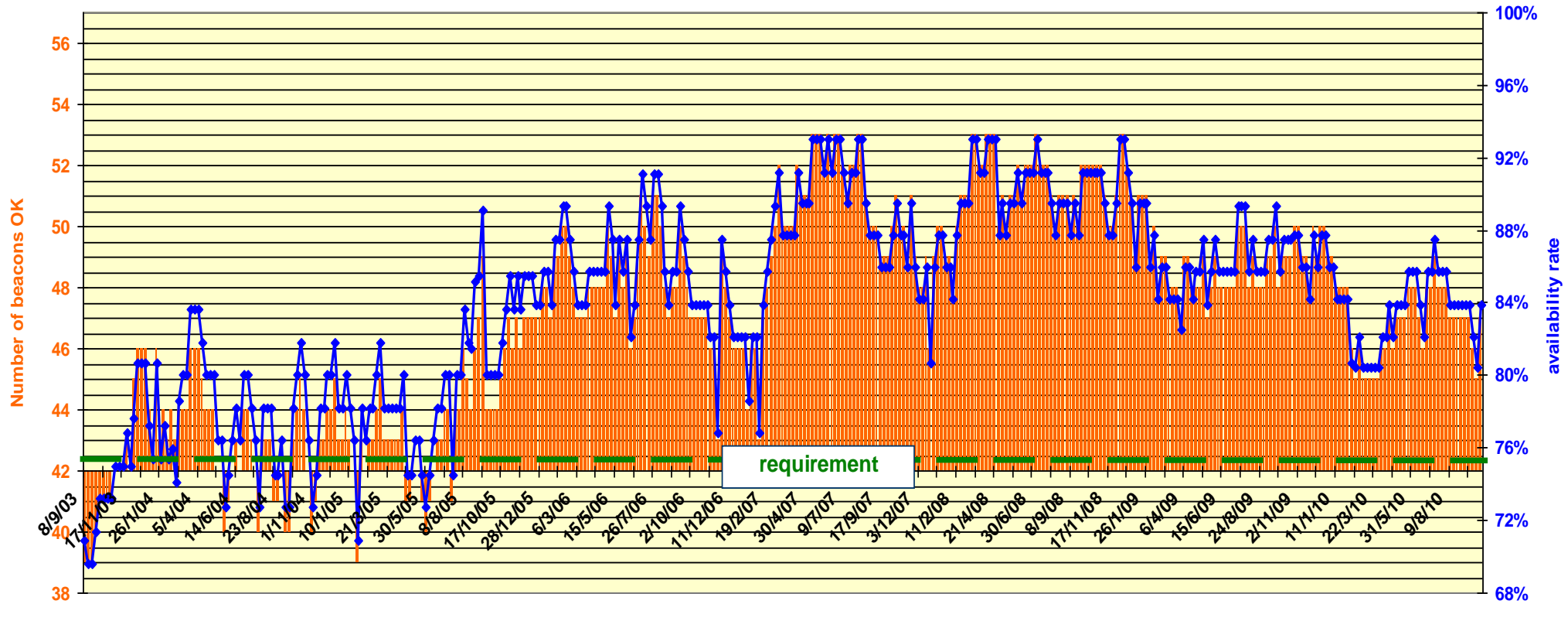


# **Doris system developments and future missions**

- oDORIS beacon status
- oDORIS network management
- oDORIS constellation

■ Today 57 beacons (56 Beacons 3.0, 1 beacon 2.0 off) :

DORIS network availability



## ■ Good news:

- ◆ **Marion Island** : **New beacon, operational again since 2010/05/20**
- ◆ **Ascension** : **New beacon , operational again since 2010/06/15**
- ◆ **Male** : **New beacon with remote control, in service since 2010/05/25**
- ◆ Beacons expected to be soon operational again: **Cibinong, Soccoro, Gavdos**
  
- ◆ **18 stations with remote control (22 expected for end 2010)**

## ■ Unavailable beacons for a long time....due various problems

- ◆ **Yuzhno-Sakhalinsk** : no reception since Nov 2005 (Badary and Krasnoyarsk in service since 2009)
- ◆ **Futuna (2.0)** : out of order since Dec 2008,
- ◆ **Santa Cruz** : no reception since 05/06/2009
- ◆ **Tristan Da Cunha** : no reception since Jan 2010
- ◆ **Port Moresby** : no reception since Jan 2010

■ **Monument peak** was stopped in June 2010 due to interference with a CBS TV affiliate

■ **Coldbay** replaces Fairbanks

■ **Riyadh, Tamanrasset** : future IDS stations (agreements with **IGN** in progress)

... see **Jérôme Saunier** presentation (IGN)

- **Goldstone (replacement of Monument Peak):**

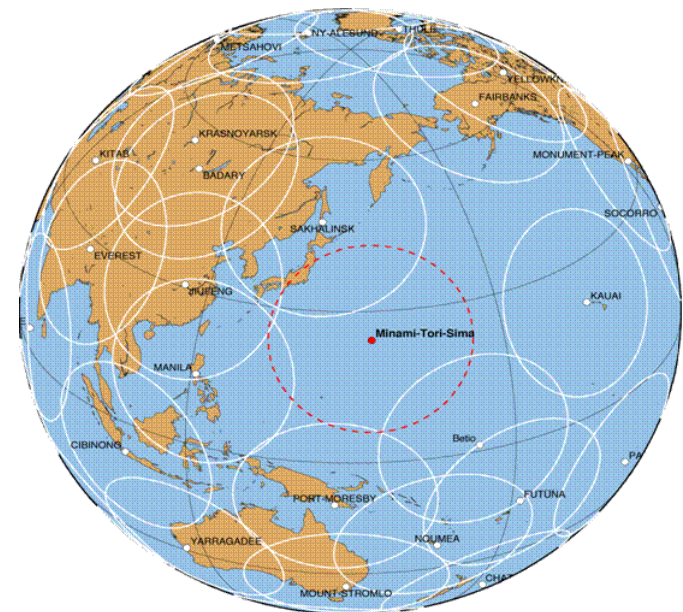
- ◆ Reconnaissance mission by F. Lemoine (NASA/GSFC)
- => positive feedback

- **Chichijima : “JAXA Ogasawara Rocket Tracking Station”**

- ◆ Meeting CNES – JAXA during a Jason 3 meeting
- => positive feedback:

“Both parties agreed that such a collaboration would be an opportunity for JAXA to enter the club of DORIS contributing agencies, which could prove useful in the frame of the design of new missions using this system”

- ◆ Next meeting and reconnaissance mission expected end 2010 CNES/IGN/JAXA



## ■ CONTEXT

- ◆ **More missions, more constraints → system requirement increase (reliability , availability..)**
  
- ◆ **Reference frame requirements → participation in the GGOS call for contribution**
  - → about 10 more stations
  - → more co-located stations with other techniques (GPS, SLR, VLBI)
  
- ◆ **→ to define a development strategy, we need to identify :**
  - Existing issues
  - Improvement plans (→ additional resources CNES/IGN/sub-contractors)

- **Most of the host agencies are voluntary (best effort basis)**
  
- **Slow reaction time penalizes the network availability**
- **Management of the delivery and returning of materials little effective**
  
- **Possible solutions:**
  - ◆ **Develop collaboration with state institutions: local police forces, meteorological centers, ...**
  - ◆ **Draw up agreements with all stations**
  - ◆ **Formalize service commitments with host agencies**
  
  - ◆ **In any case: encourage relations with agencies interested in geodesy.**

## ■ Transmission authorization

- ◆ Clarify the current status of each station
- ◆ Obtain official authorization for stations where we currently have none.
- ◆ manage and follow up on authorizations.

## ■ Agreement management with Host Agencies

- ◆ reduce the time to draw up agreements,
- ◆ manage agreement renewal

- **Maintain / improve expertise regarding beacon hardware**
  
- **Network requirements**
  - ◆ **Beacon upgrade:**
    - **3.1: improve reliability, meteo sensor included (new baseline)**
    - **3.2: reduce mask and multipath (longer cable length with deported amplifier close to antenna)**
  - ◆ **Material is getting old → need to replace old beacons,**
  - ◆ **New beacons for new sites (GGOS requirement, ...)**
  
- **Other hardware improvements : antenna, USO, ...**
  
- **→ several evaluations are to be carried out:**
  - ◆ **Inventory of the ages of beacons, life expectancy, renovation plan & corresponding costs**
  - ◆ **Stock required to avoid the problem of replacing beacons**
    - currently 10 beacons in stock for 57 stations
    - New contract, then manufacturing of new beacons foreseen for mid 2011



## ■ Compatibility, interference between the different technologies:

- ◆ more co-located sites (current recommendation)
- ◆ VLBI: a study in progress ( Chris Beaudoin from Haystack Observatory)
- ◆ Galileo: study to be done (with RF expertise)
- ◆ No interference with SVOM

## ■ Experiment stations (called IDS stations):

- ◆ Establish station procurement by the scientific bodies themselves

### ➔ conditions:

- such station shall be installed by SIRS (IGN) and maintained by SMOS (CNES).
- compatible with: " system requirements for management of the DORIS station network » now available on [www.ids-doris.org](http://www.ids-doris.org).

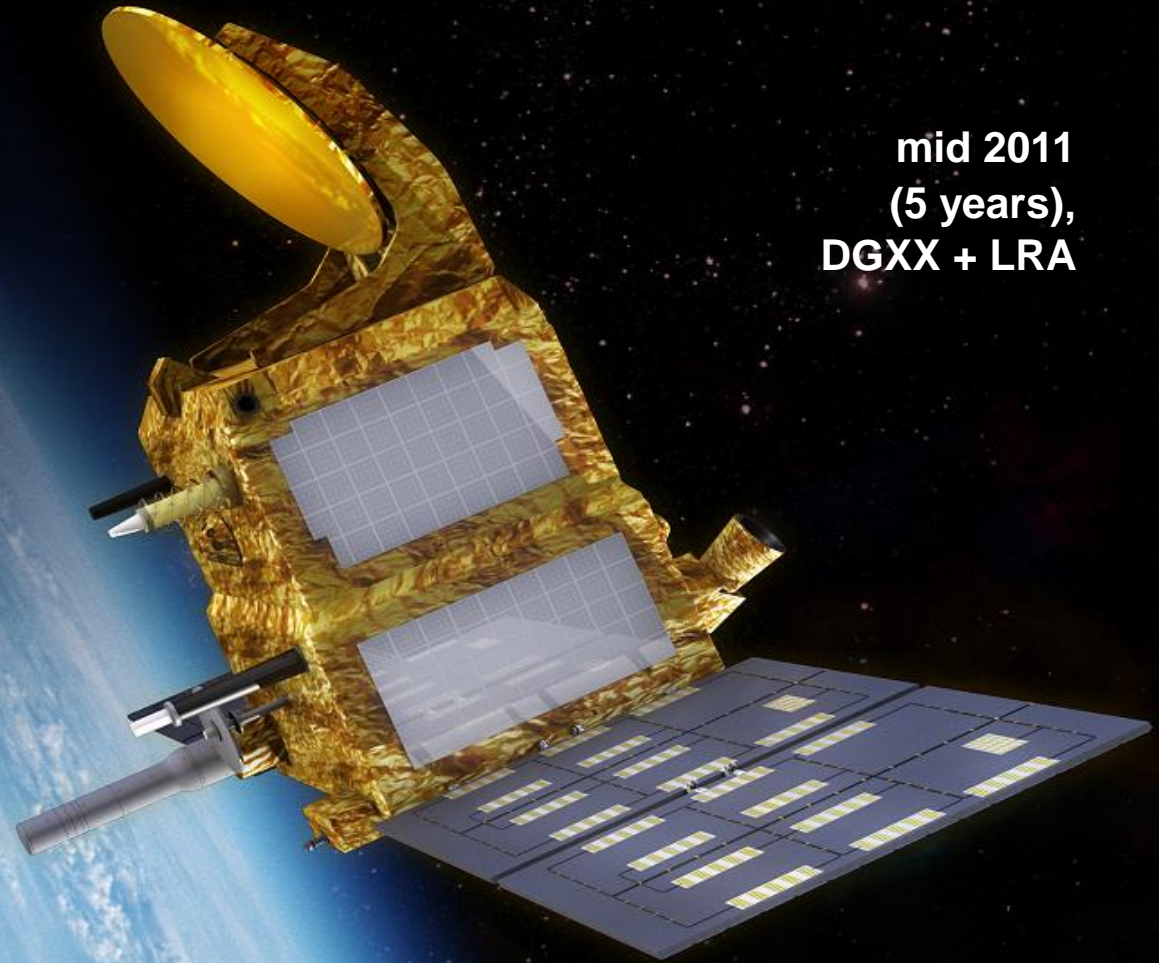
- **CRYOSAT-2 (ESA): 717 km, 92°** April 8, 2010,  
→ end 2013, (**DGXX + LRA**)



- **JASON2 (CNES/NASA): 1336 km, 66°** June 2008 → 2013, (**DGXX+LRA+GPS**)
- **ENVISAT (ESA): 800 km, 98.5°** March 2002 → 2013, (DGXX+ LRA)  
Oct 2010: orbit change: altitude reduction: -17 km
- **SPOT5 (CNES): 830 km, 98°** May 2002 → 2015
- **JASON1 (CNES/NASA) 1336 km, 66°** Dec 2001 → 2011...
- **SPOT4 (CNES): 830 km, 98°** March 98 → 2012

# Future missions / SARAL/ALTIKA (ISRO)

mid 2011  
(5 years),  
DGXX + LRA



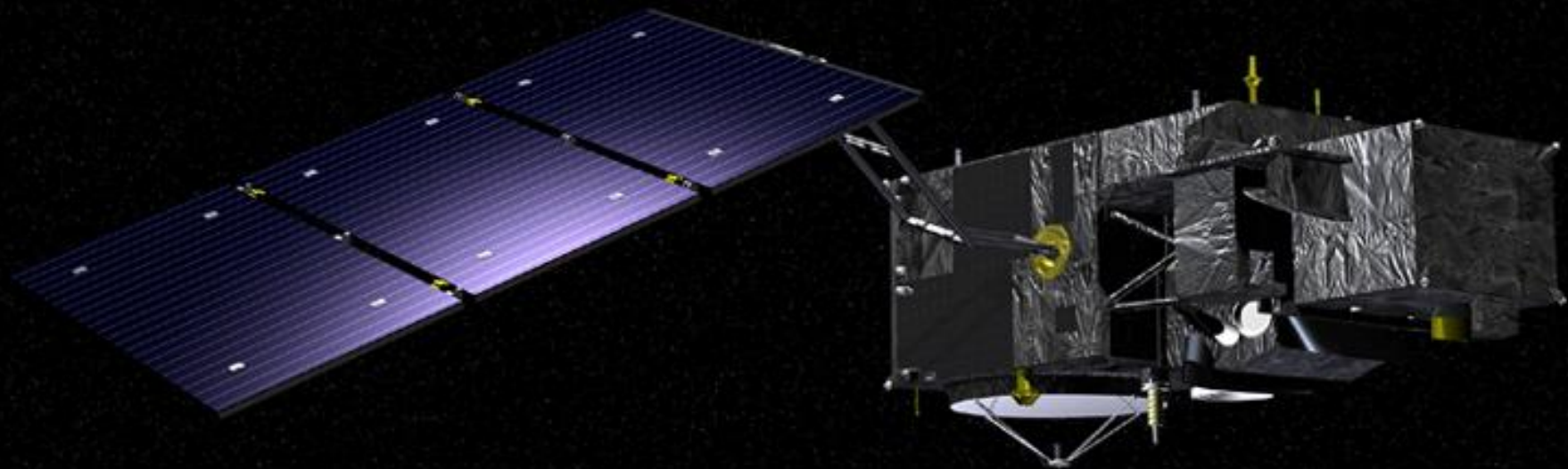
**June 2011  
(3 years), DGXX+LRA+GPS  
then HY2B, 2C, 2D... to be confirmed**



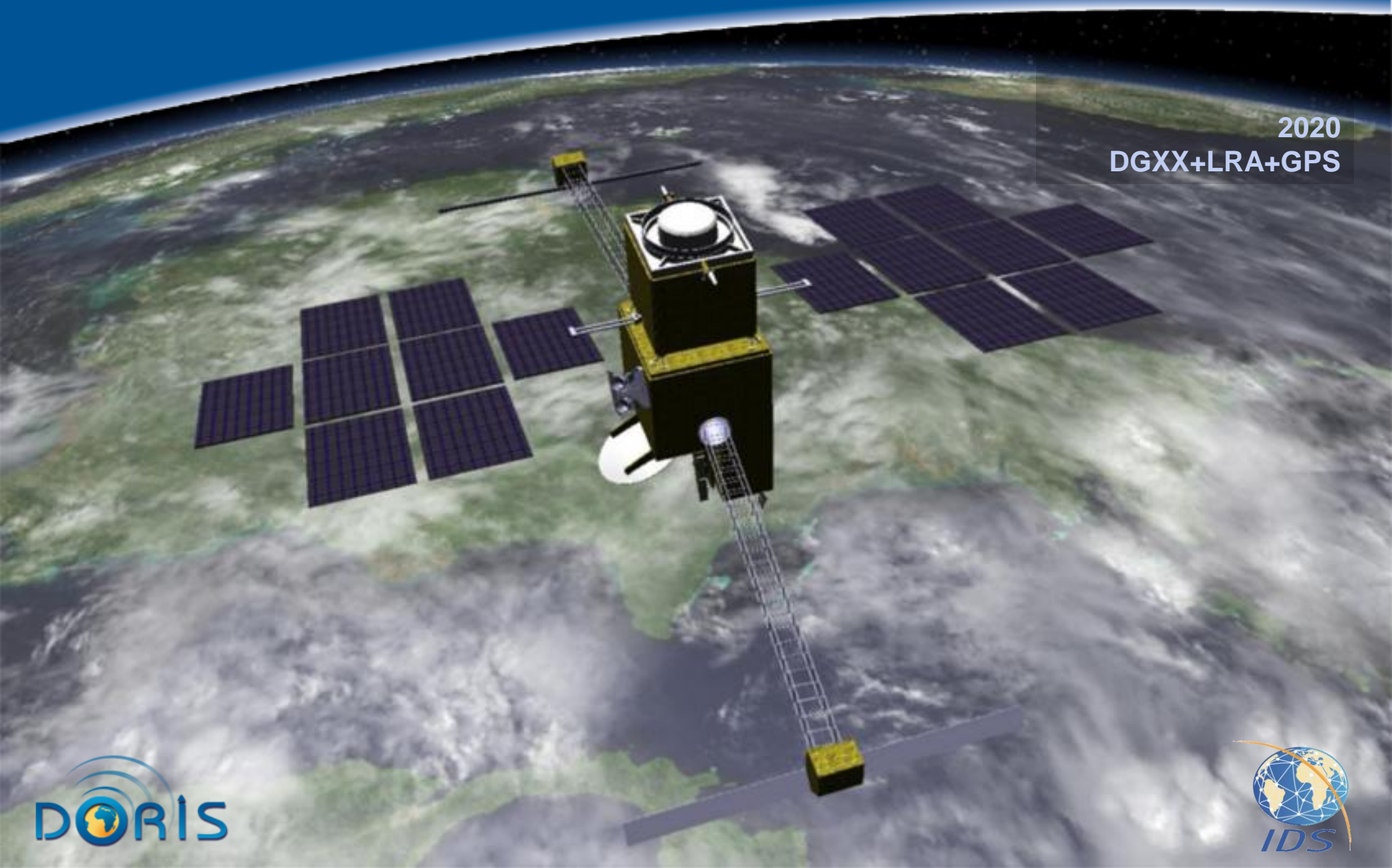
2013, (7 years),(DGXX+LRA+GPS)

Sentinel 3B: 2015

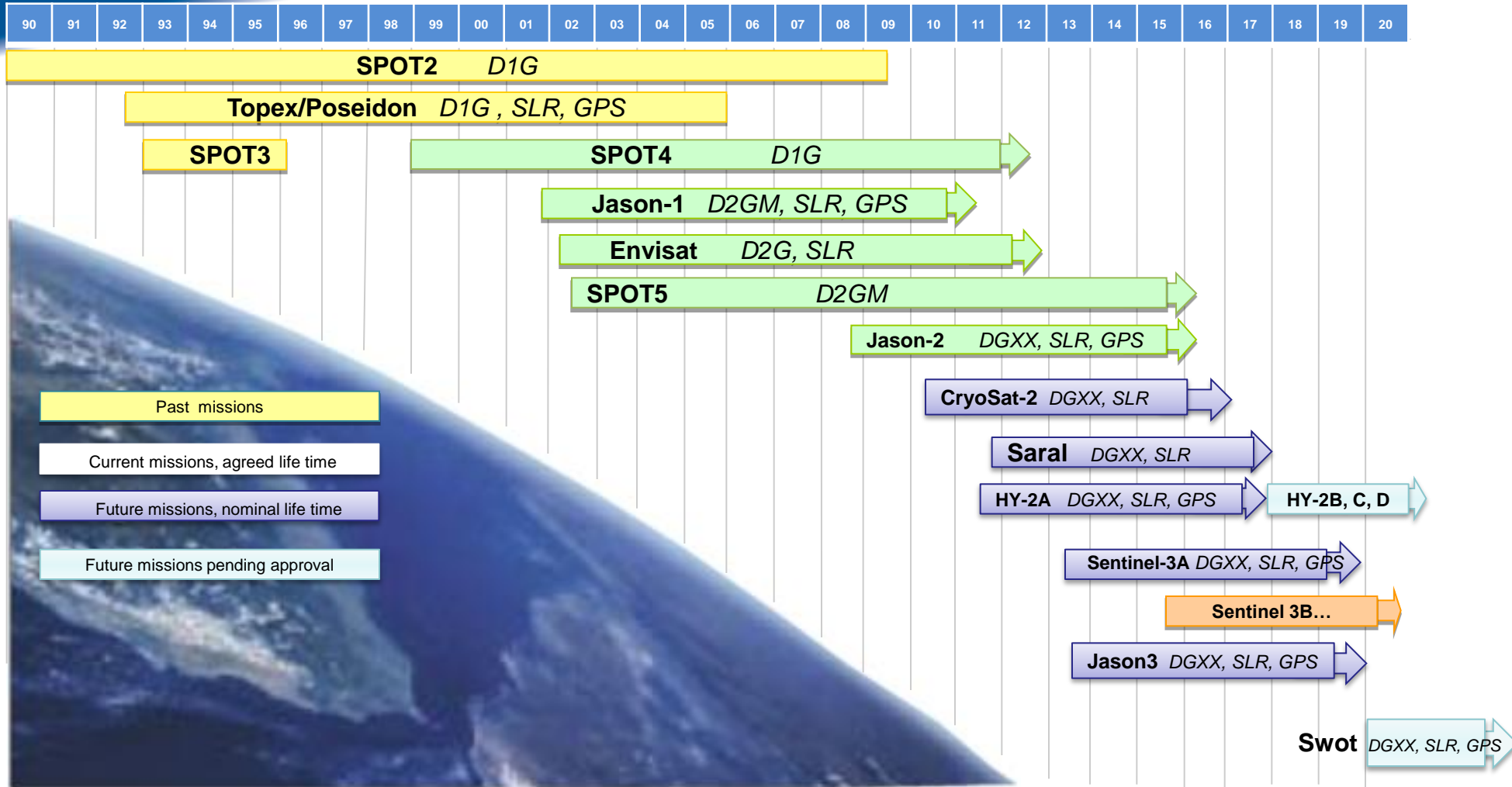
3C, 3D: to be confirmed



end 2013  
DGXX+LRA+GPS



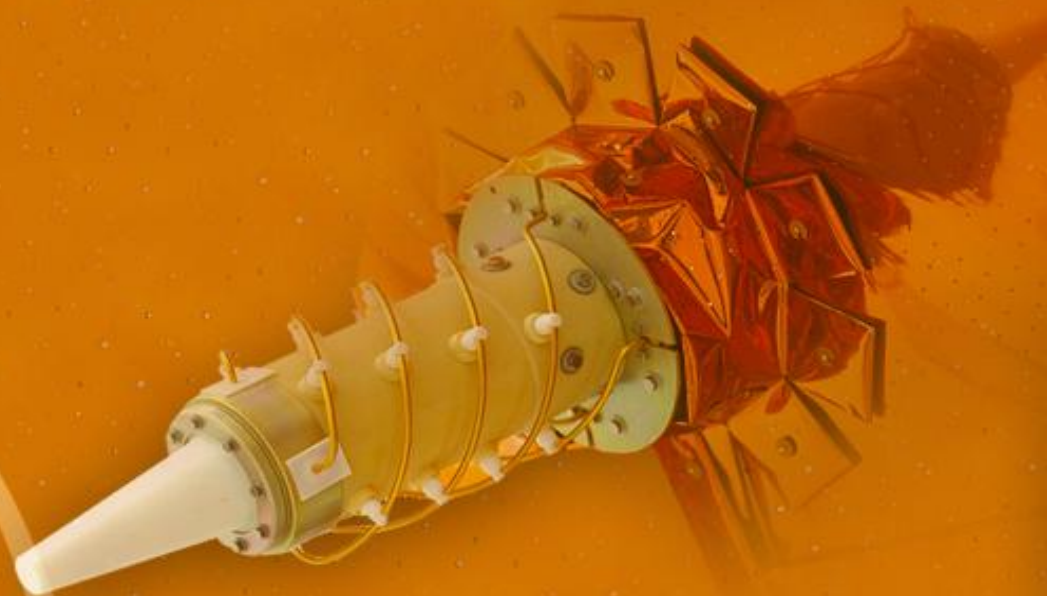
2020  
DGXX+LRA+GPS







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Thank you

