

DORIS

DAYS
2025

November, 3 and 5

DORIS: Some context

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November 3, 2025

Day 1



DORIS?



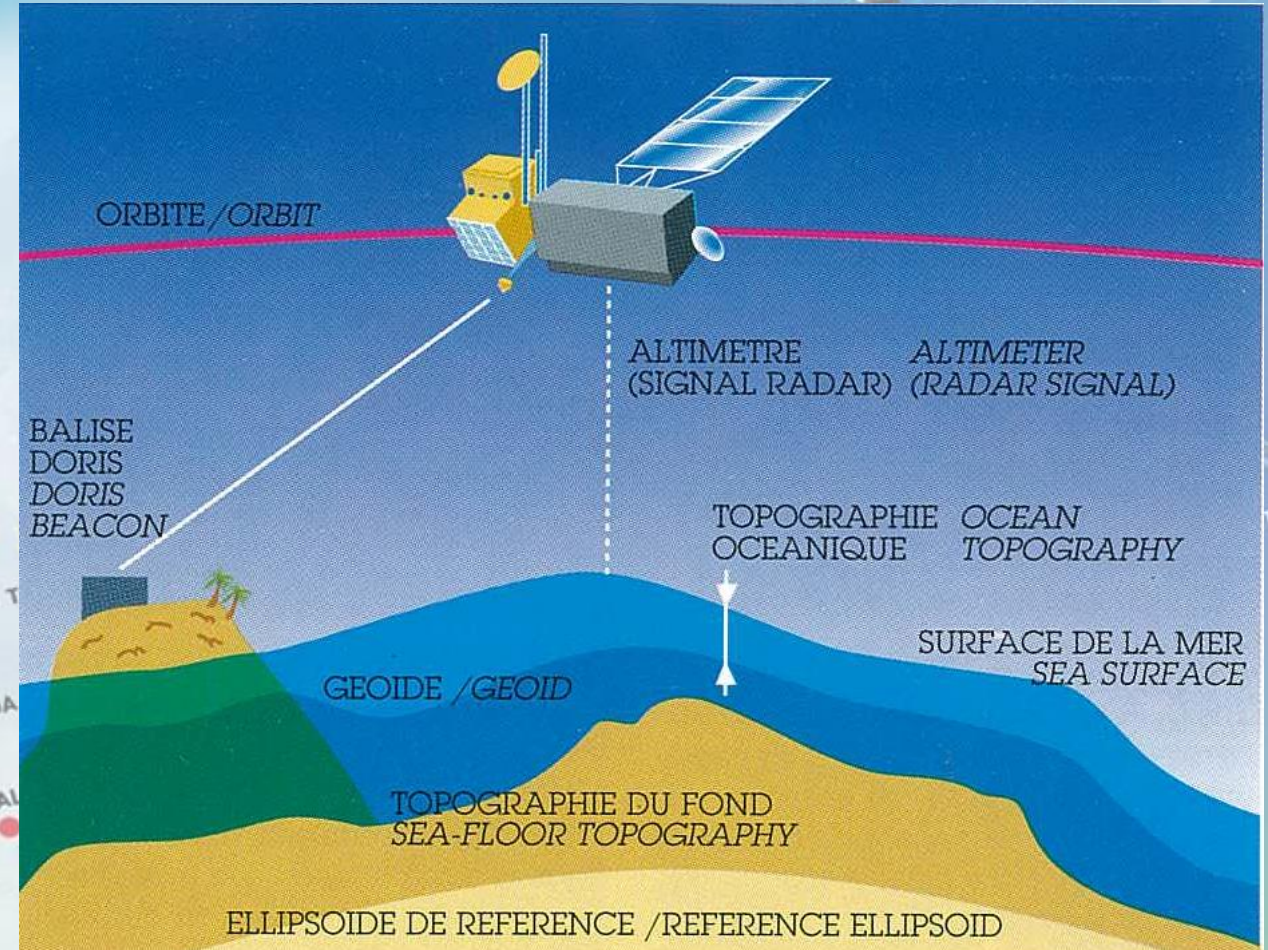
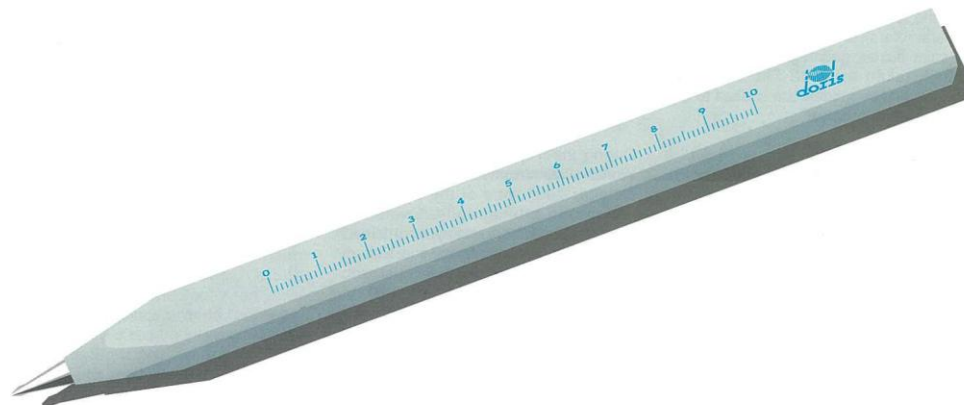
DORIS stands for

-  **D**oppler **O**rbitography and **R**adiopositioning **I**ntegrated by **S**atellite
-  **D**étermination d' **O**rbite et **R**adiopositionnement **I**ntégrés par **S**atellite
-  **D**eterminación de **Ó**rbita y **R**adioposicionamiento **I**ntegrados por **S**atélite
-  **D**eterminação de **Ó**rbita e **R**adioposição **I**ntegrado por **S**atélite

An essential tool for altimetry missions



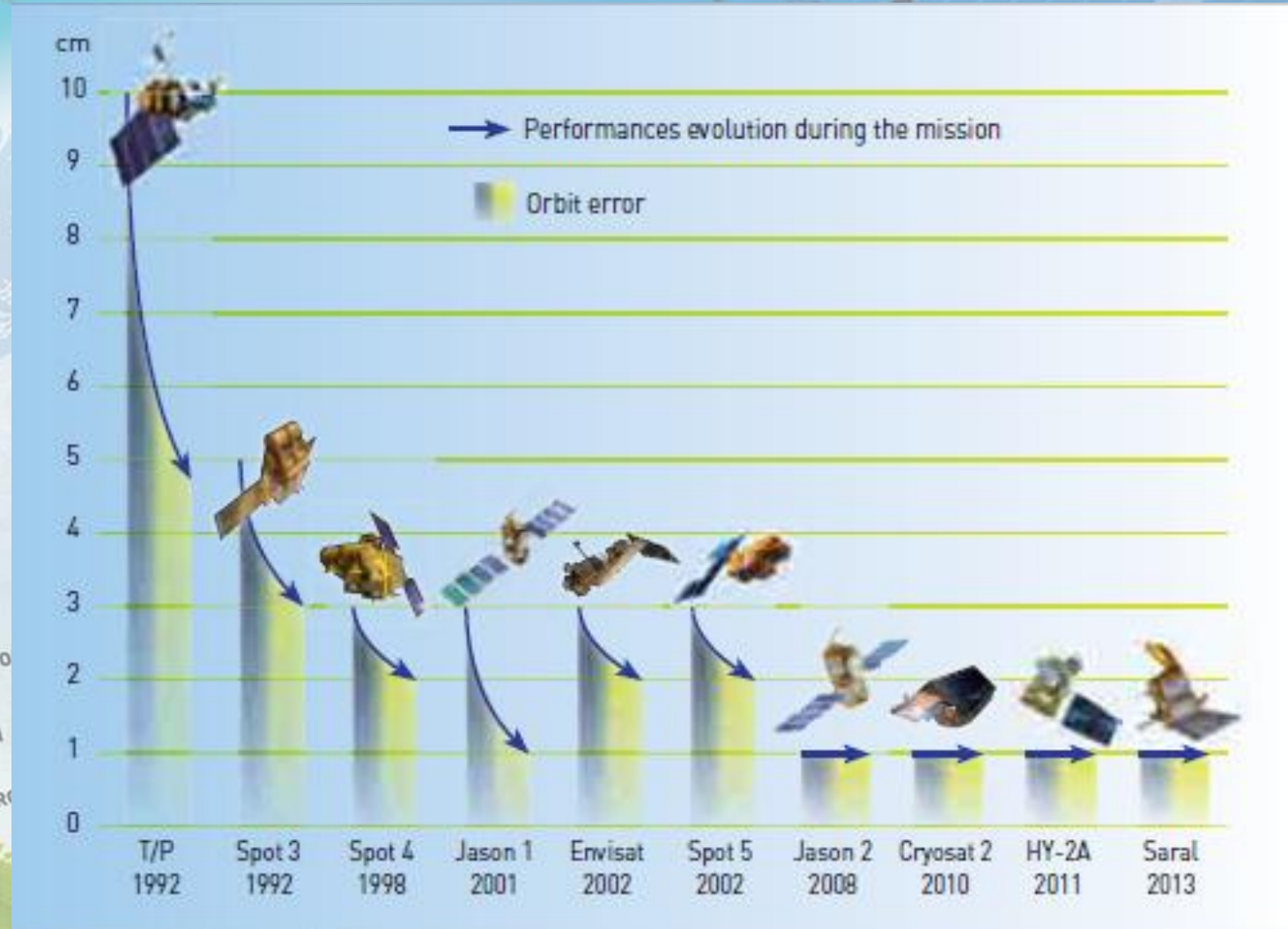
- Initially designed to meet the need for very-high precision orbit determination of TOPEX/Poseidon (1992-2005)
- Objectif: orbit restitution within 10 cm.



DORIS newsletter Nov. 1990

DORIS for POD

- Objective 10-cm precision quickly met and exceeded
- From 10 cm to 2.5 cm for the satellites carrying the first two generations of instruments
- Since Jason-2, 1 cm or even better thanks to the improvements made to the whole system (on-board and ground instruments, monumentation, processing, ...)



DORIS for Geodesy

From its conception, DORIS has been designated for the precise location of the network stations.

- **1990**: the first DORIS instrument is on board **SPOT-2**
- **1992-1993**: first publications on **DORIS positioning** with SPOT-2 data: positioning accuracy of 10-20 cm, then 5-7 cm after improvement of the processing strategy
- **1994**: first contribution to **ITRF** (2 groups: IGN and LEGOS/CLS)
- **1995**: measurements of **tectonic plate motion** with 3 years of data; first geodetic determination for the African plate
- **1999**: first comparison between altimetry and tide gauge and **DORIS vertical motions**

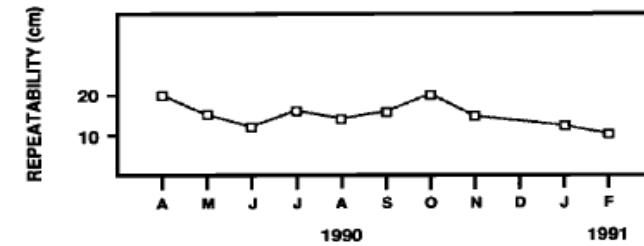
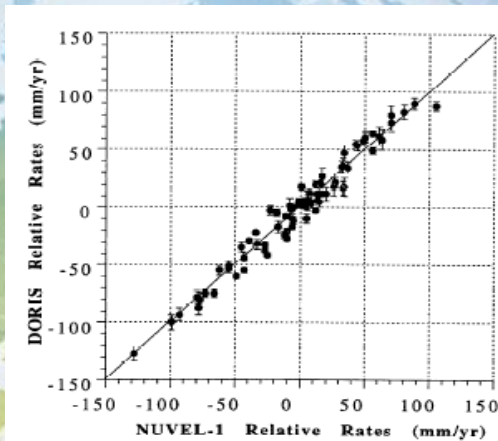
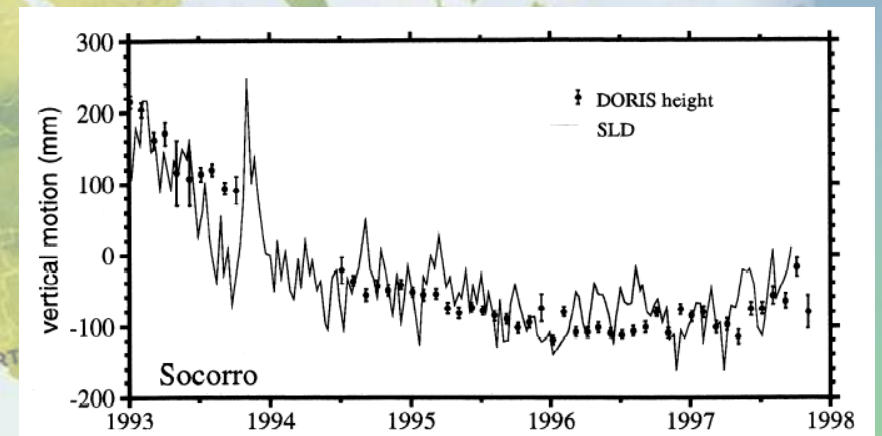


Fig. 6. Monthly repeatability in absolute positioning (whole DORIS network considered)

Cazenave, Valette, Boucher (1992)



Soudarin and Cazenave (1995)



DORIS in a few words



DORIS is:

- A French civil satellite tracking system designed for **Precise Orbit Determination (POD)** and high accuracy **ground positioning**
- Developed by **CNES**, the French space agency, in partnership with France's mapping and survey agency **IGN** and the space geodesy research institute **GRGS**
- Optimized for the **ocean's topography observation missions** with extreme precision, global coverage and all-weather measurements.
- An **uplift** and **centralized** system based on **Doppler** shifts measurements of RF signals transmitted by a worldwide beacons network