

The 2013 Ibiza calibration campaign of Jason2 and Saral altimeters

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Aim

precise calibration of Jason2 and Saral altimeters with the help of 5 GPS buoys

Experiment coordinator

J.J. Benjamin Martinez / Universitat Politècnica de Catalunya (UPC)

Participating teams

- UPC: C. Gracia, R. Lopez, A. Tapia, I. Valles, J. Gili
- ROA: J.M. Davila, J. Garate
- GRGS/CNES/OMP: R. Biancale, F. Frappart, N. Roussel
- Puertos del Estado: B. Perez (Ibiza tide gauge & GPS)

Ship

Patrol ship Toralla of the Spanish Navy

Calibration location

Jason2-Saral crossover point North of Ibiza (Spain)

Latitude : 39deg. 35.74'

Longitude : 1deg. 42.69'

Jason2 crossing time : 7h 37mn 45s UTC

Saral crossing time : 5h 28mn 49s UTC

Buoys deployment

4 buoys displayed along track and cross track at 1 nautical mile interval around the crossover point + one buoy at that point in order to get position and sea slope

Experiment duration

4 hrs at each deployment site over 3 days

Experiment phases

- 14 September, 11am-4pm : pre-calibration of the 5 buoys with the Ibiza tide gauge to reference the GPS antennas to the sea level
- 15 September, 6am-10am : GPS buoy positioning at the crossover point
- 16 September, 5am-9am : GPS buoy positioning at the crossover point
- 4pm-8pm : post-calibration of UPC buoys with the Ibiza tide gauge

Oceanic current forecasting

daily current maps from Mercator Ocean

The 2013 Ibiza calibration campaign of Jason2 and Saral altimeters was initiated at Prof. J.J. Benjamin's instigation (UPC) with the fruitful participation of the "Real Observatorio de la Armada" (ROA) of the Spanish Navy who places a 28m long military ship at disposal: the patrol vessel Toralla. This research has been funded under the Spanish National R+D+i (ref: CGL2009-13435/CLI). Particular thanks are addressed to LEGOS and IPGP for having made GPS buoys available, to the CLS company for having lent localization instruments (Argos buoys and goniometer) as well as to Mercator Ocean for the diurnal delivery of current maps.



Saral



Jason2



Patrol vessel Toralla

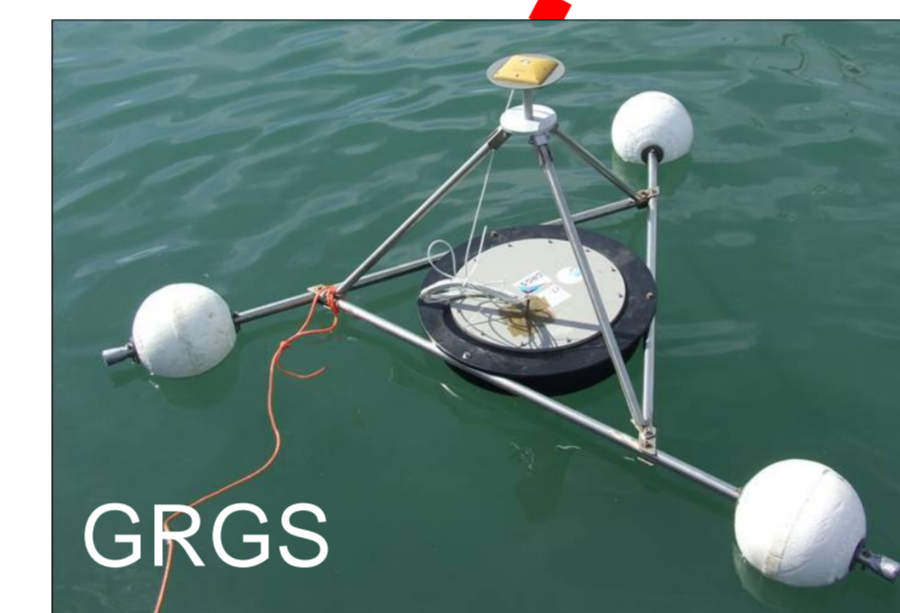


Buoy recovery after 4hrs in water



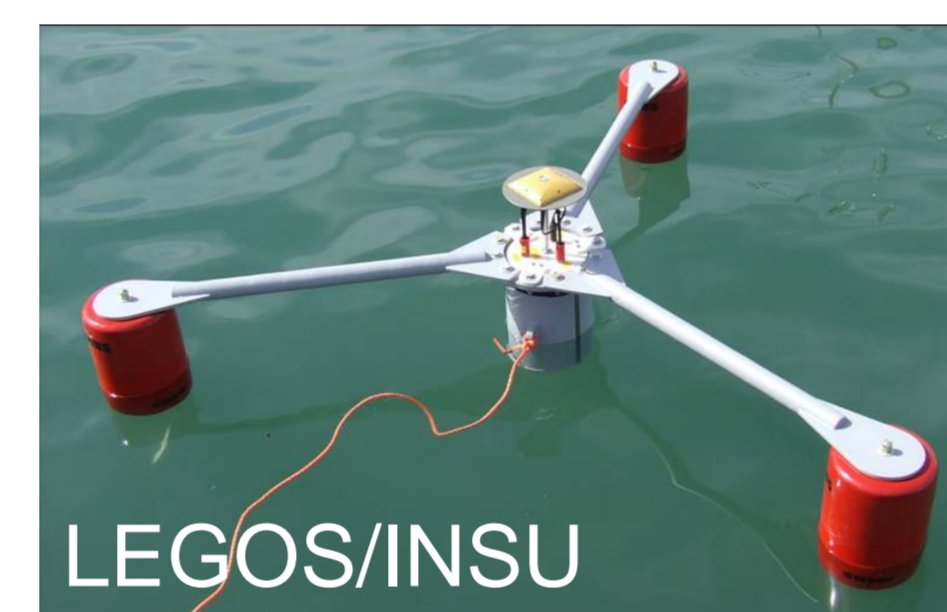
Organizing Committee with the Toralla's captain

Jason2 and Saral altimeters were cross calibrated at the mixed crossover point North of Ibiza at their ascending passes, respectively on 15 and 16 September 2013



GRGS

The GPS buoy antennas were first referenced to the sea level at the Ibiza tide gauge

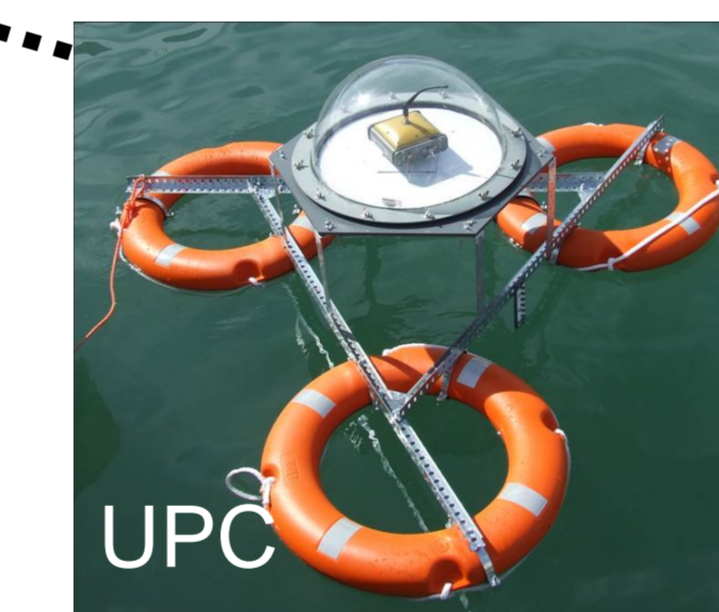


LEGOS/INSU



IPGP

Different types of GPS buoys used



UPC



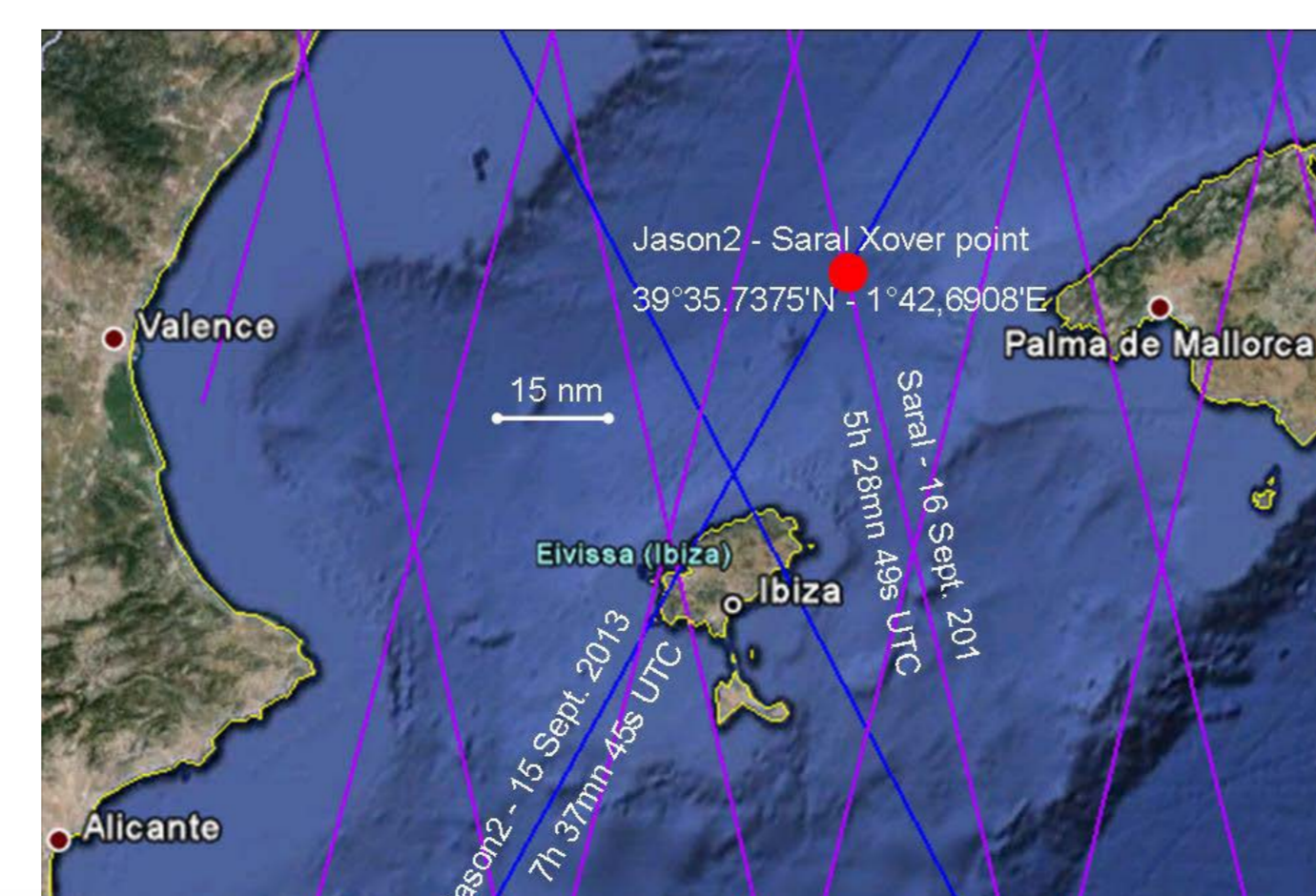
UPC



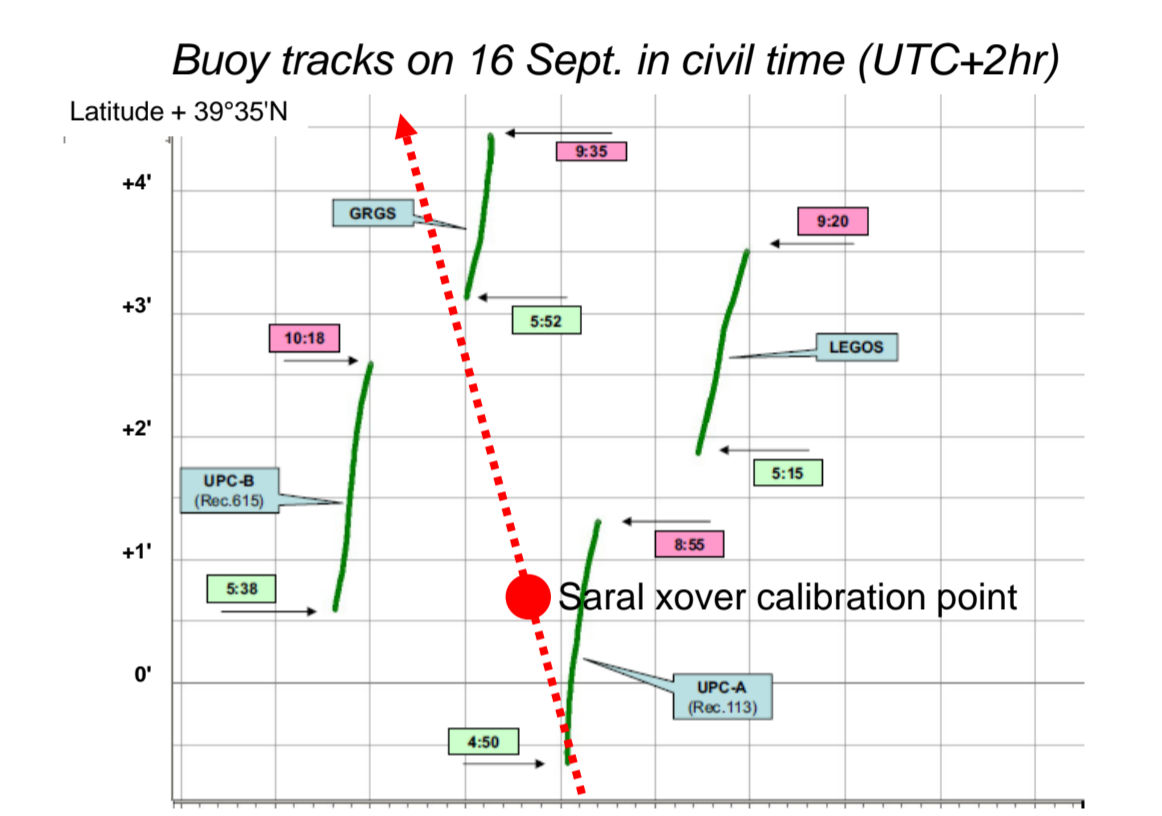
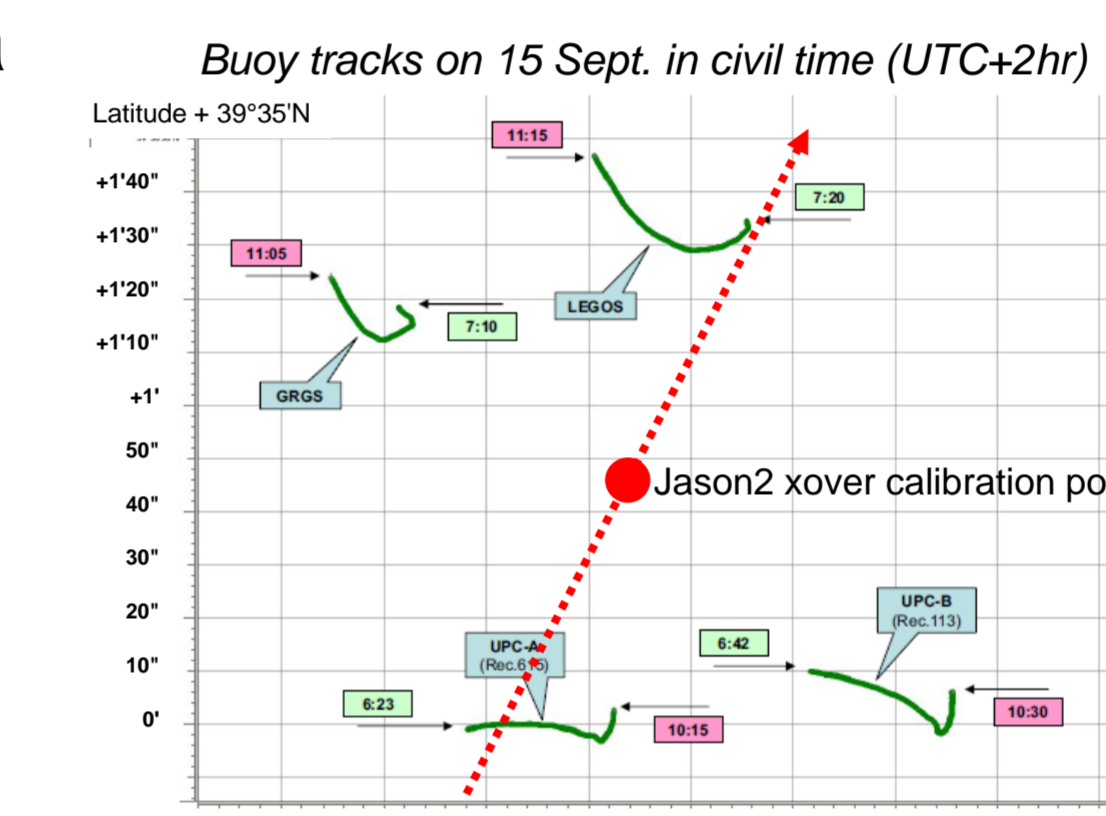
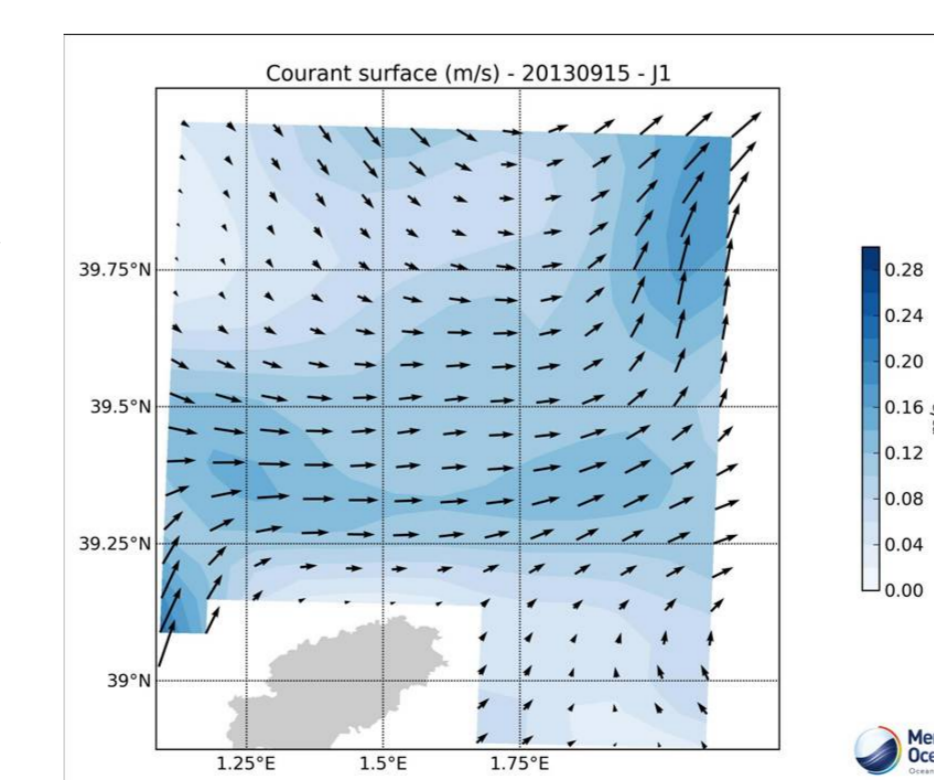
CLS

ARGOS/CLS buoys were tied up to each GPS buoy. CLS sent positions each 15mn through the Iridium satellite service to allow to recover the buoys easily

The buoys were located on the track and crosswise at 1 nautical mile distance (1.852 km)



Example of current map from Mercator Ocean used to anticipate the buoy drift during 4hrs (around 1 km)



Maps of buoy displacement during 4 hrs

Processing

- 1) pre-campaign Jason2 and Saral orbit prediction with the GINS/GRGS software fitting SLR data from previous days
- 2) post-campaign GPS buoy processing with the GINS/GRGS software both in IPPP mode and in semi-dynamical mode
- 3) Jason2 and Saral orbit processing with the GINS/GRGS software in semi-dynamical mode fitting GPS/DORIS/SLR tracking data

Expected results

- 1) calibration of the 5 buoy antennas with respect to the sea level from GPS and tide gauge data
- 2) computation and smoothing of the buoy position from GPS data at the Jason2-Saral mixed crossover calibration site (by interpolation) and at the Jason2-Saral pass times exactly (to be achieved yet)
- 3) comparison with the Jason2/Saral altimeter data (to be achieved yet)

The goal is to achieve an optimal calibration of Jason2 and Saral altimeters in deep sea. Results will be published and presented next year as well as provided to the Jason2 and Saral project managers