# THE TOPEX/POSEIDON AND JASON-1 CALIBRATION CAMPAIGNS IN BEGUR CAPE AND IBIZA ISLAND REGIONS

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# ABSTRACT

The regions of Cape of Begur and Ibiza island have been chosen for JASON-1 altimeter calibration. Two methods will be used: calibration from direct overflights using GPS buoys not requiring modeling of good or tidal errors, and indirect calibration using coastal tide gauge observations that requires geographical mapping of seoid and ocean tides. The last implies the determination of the Mean Sea Surface (MSS) from the MSS obtained very precisely from altimetry plus the MSS bias determined by independent measurements in our case GPS buors. The GPS solutions allows to adjust the shape model of the MSS to obtain an absolute reference surface which can be used to calculate the altimeter bias for any satellite that crosses the area. The

reference andrese which can be routed out colorable the all mores has for any smallen that consort the arm. The maniput coloring is a straight of the consort of 1800 periods the shall period the MSS biol. The of the con-stant of the period the consort of 1800 periods the straight of the consort the MSS biol. The straight of the consort of the consort of 1800 periods of the consort of 1800 periods and the period the consort of the consort of the consort of 1800 periods of the consort designed at the Consort of the consort designed at the Consort of the co

numeral is design promotion that University of Constance and a performance unsome culturation of 10Pex limiteres side R A second comparing with an advanced GPS have have made on Jaly 2000 with an estimation of the altimeter bias than kints at the level of accuracy that might be achievable for JASGN-band other future altimeter missions are ENVISAT from the European Space Agency, EA. EN 1 General view of 1 Infrar village and

Other objective bay been to GPS man the MSS and to law the foundation for a seneral indirect calibration site which allows to calibrate altimeter from different satellites The operation is seen to try map the associate to any the parameters of a service measure canonical set with the measure parameter parameter is an appendix suferiness reasoning the area. The experiments contribute to collisations of emerging global service velocity records from TOPEX/POSEIDON and its successors. The CATALA experimece has been sponsored by the Spanish Government CICYT (Comission Interministerial de Ciencia y Tecnologia) as a National Coordinated R+D Project in Space Research and John Space and Space and Space and Space and Space and Space Action and Space Space and Space Space and Space Space and Space participation from France and the United States.



## INTRODUCTION AND LOCATIONS

he instantaneous sea level along the TOPEXPOSEDON ground track is ompaned with the measurements of the sea surface height estimated at the serflight point and at the same time by two independent techniques:

The estimated sea level height obtained by using a kinematic point The estimated instantaneous sea level height at the overflight point after the application of suitable tide models on the measurements of several tide n of surrants are aced at the coast. 1000

tely, the CATALA Experiment has realized the monitoring of the sea level height obtained from the TOPEX-B altimeter at the North Occidental Meditermana Sra (1), (2). It is enviraged for the next campaigns in the Cape of Begar area and the Ibiza island area (image provided by Eric Jeanson, CNES).

# THE ELEMENTS OF THE CAMPAIGNS



GPS station at Lintrac Hotel (LLAF): In image A, the TRIMBLE-400355 in preservice for storaging the GPS data. In image B, the installation for the DD image B, the installation for the DO COLIN Trimble asterna at the lotel terrace. The permanent GPS stations belonging to the t Conteptife de Casalonya (ICC), used in the processing of the GPS data. In image C, the de Sewarra (BELL). In image D, the station Cap de Creas (CREU).

#### 2. THE TIDE GAUGES

THE AANDERAA PRESSURE

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are G: View of the





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THE SEA LEVEL TIME SERIES

### THE ABSOLUTE BIAS OF THE ALTIMETER

1200 2830 2600 8808 6000 7283 840

CATALA GPS data processing results: GIPSY software, M. Martínez et al., 2000, UPC (3) | MP-TOPEX | = 7.6 + 10 cm DMT-TOPEX | = 4.8 ± 8 cm

# OTHER APPLICATIONS

The data collected by the CATALA experiment in 1999 has been also used by the authors and O.Colombo at OSFC/NASA to test precise positioning the baoys in the high seas. It has been determined the instantaneous position of one of the buoys using a precise, long-range, instantaneous position of one of the burys using a precise, rong-range, differential kinematic technique (4). This long-range technique includes using a Kalman fibre and a smoother to solve simultaneously for: carrier phase LC biases, msidual tropospheric refraction, orbit errors, and errors in site coordinates, as well as for the instantaneous coordinates of the

A precise, short-more trajectory was computed for the buoy, relative to its nearby coastal reference at Llafanc, 14 km away. The tidal data was used to verify this solution (asing a 6-minutes running average to

chainer of data of waves from the OFA data of data of balance of the origination of the o

ARDA EXPO

Fig. 3

# REFERENCES

1 Krainings G. Haines B. Ma z-Benjamin, J.J., Martinez-Garcia, M., Talaya, J., Ortiz, M.A. And Perez, B.:"The CATALA experiment: Preliminary results of Alt-B Calibration using GPS Buoys of

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The series from both the float excees with Thelimeder shaft encoder and from the AANDEPAA resource senser we

The series from norm the total gauge with *International* shall encoder and from the AANDERAA pressure sensor are showed in Fig. 1.One of the two series has been shifted a constant value in order to be able to visualize both of them showed as Fig. 1. One or time two senses has been sensed as constant value in coper to be abeed to visualize fourit or team in the same good. Also the instanceous differences and the statistics (mean and standard deviation) from the two version are included. As it can be observed, there is no drift in the mean and the instantaneous differences between sen levels meended by the two different technologies are occasionally highlift on an anaismun) doming the two

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Ticle gauges at Lisfrans harbour.

The sea levels registered by the acoust ages placed in Barcelona harboar, belonging to the Spanish Harboar's Tide Gauges Network (REDMAR), for meriad than in Fig. 1 ment between the float many and th or to show henter the ser

In order to show better the agreement between the most gauge and ANDERAA pressure sensor results, the series of sea level measurems without seiches are shown (week from 30th March to 6th April when important seiches occurred neither in Llafrate nor in Barcelora).For period, the mean agreement is still good, 045 mm, and the mus drops to 7.2 mm. Both tide gauges are releved to a product benchmark placed in Linforce, harboar jetty and also have been periodically manual calibrated in order to mensioning the agreement in their mean scenarizet, flig. 2.1

> Views of babilities MP GPS have (rewaided ith a MICRO-PULSE antenna) and th (provided with a DORNE GPS have MARCOLIN TRIMBLE J and K, rospo Finally, a sem derine

Other CATALA GPS data processing: · GIPSY software, G.L.H. Kruizinga et al., 1999, JPL ? · KARS software, C.K. Sham et al., 1999, OSU





