

# Recent Results for the Estimation of the Altimeter Bias For the Jason satellites Using Gavdos.

Mertikas, S. P., R. Ioannides, X. Frantzis, P. Partsinevelos, A. Tripolitsiotis  
 Technical University of Crete,  
 Geodesy and Geomatics Engineering Lab,  
 Mineral Resources Engineering, GR-73 100, Crete, Greece.  
 Tel: +30-821-37 629, email: mertikas@mred.tuc.gr

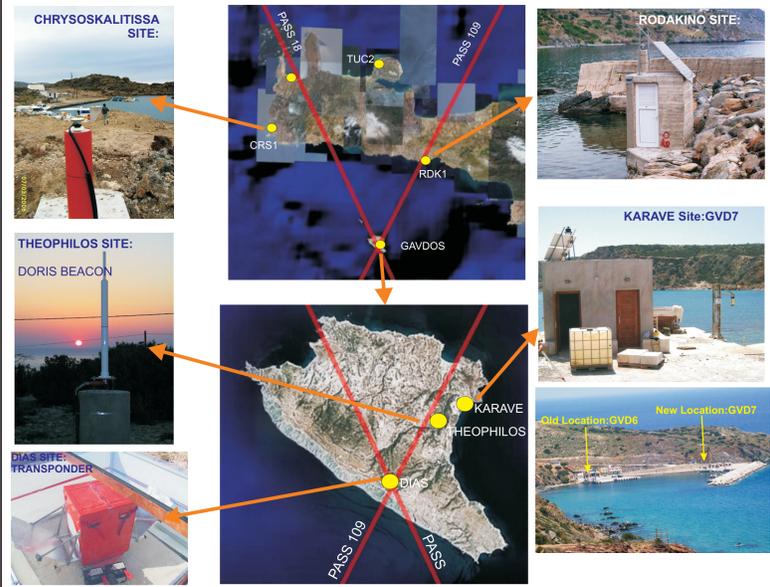


## Abstract

The dedicated calibration site for satellite radar altimeters in Gavdos has been operational since 2004. The small island of Gavdos is located along a repeating ground track of Jason satellites (crossover point of No.109 ascending and No.18 descending pass), and additionally where the altimeter and radiometer footprints do not experience significant land intrusion. The purpose of such permanent Cal/Val facility is to calibrate the sea-surface height and ancillary measurements made by the Jason satellites as they pass overhead, by using observations from tide gauges, GPS, DORIS and other sensors directly placed under the satellite ground tracks.

Altimeter calibration at Gavdos has been performed by averaging sea-level anomalies as produced by the satellite altimeter measurements and then comparing the result with the tide gauge observations. The absolute altimeter bias of Jason-2 has been determined using 20-Hz, cycles No.2-28 (GDR data) as well as of Jason-1 bias, Cycles No. 209-259 with the GDR-C data. The altimeter errors have been estimated to be  $B2 = +171.70 \text{ mm} \pm 49 \text{ mm}$  for Jason-2, and  $B1 = +84.29 \text{ mm} \pm 42 \text{ mm}$  for Jason-1.

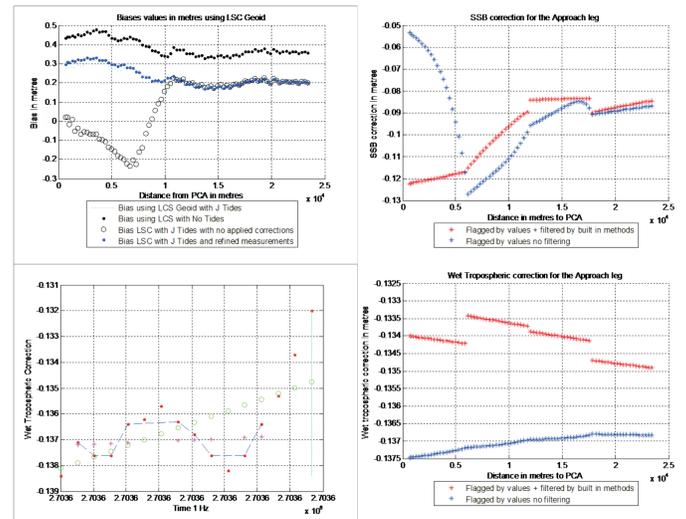
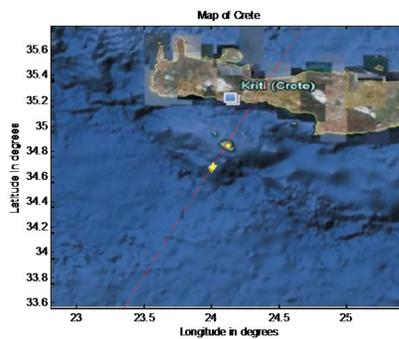
## The CAL/VAL FACILITIES



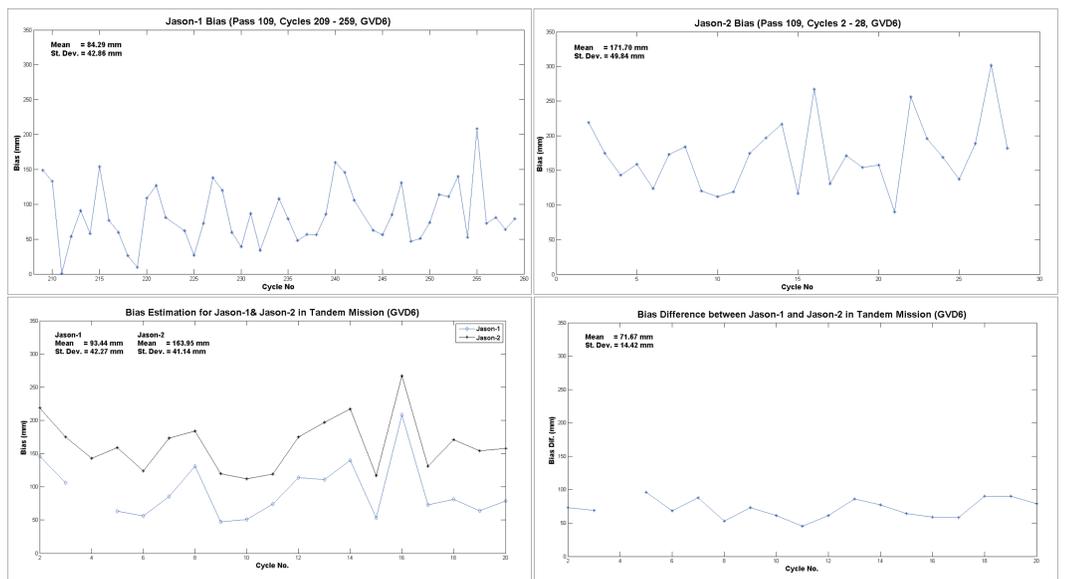
## CORRECTION MODELS AND THEIR APPLICATION

<i>IONOSPHERIC</i>	Mean over -21sec to -1sec around the TCA (~140km).
<i>DRY TROPOSPHERIC</i>	Linear fit over -5sec to +2sec around the TCA interpolated at the TCA.
<i>WET TROPOSPHERIC</i>	Linear fit over -15sec to -5sec from TCA (avoid land contamination, ~30km). Last fit value used for all overflight data.
<i>SEA STATE BIAS</i>	Cubic fit over -10sec to -1sec from TCA till TCA -1s.
<i>GEOPHYSICAL</i>	IGDR and GDR-C corrections for: Ocean loading, solid, tide, pole tide.
<i>TIDE GAUGE</i>	Linear fit over 30 min centered on TCA (6-min sampling).

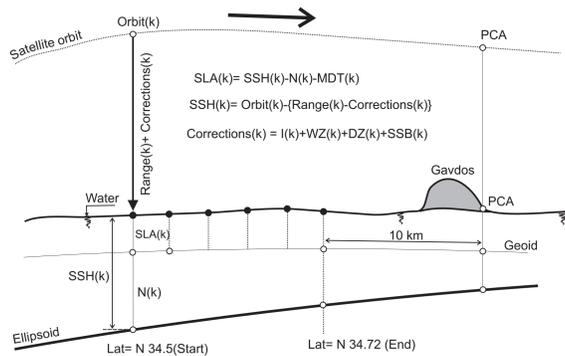
## TuC-alibrat Tool



## Calibration Results

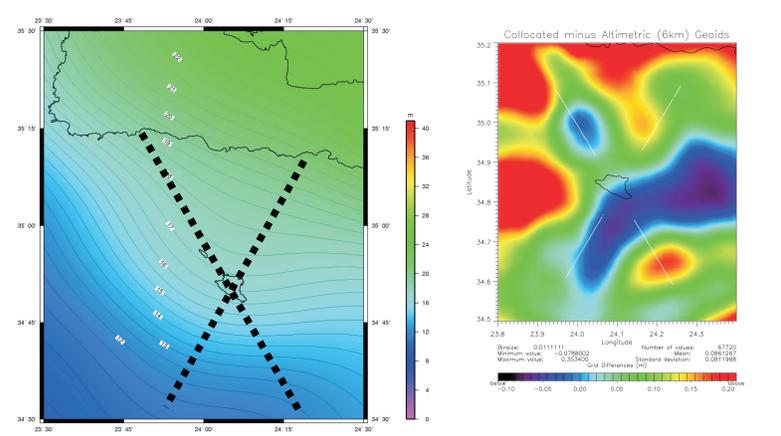


## METHODOLOGY (PASS Number 109)



## LOCAL GEOID

## Differences in Geoid



## CONCLUSIONS

- A new software tool (**TuC-Alibrat**) has been developed by TUC for the determination of the Jason satellite bias.
- The systematic error of the Jason-2 altimeter between cycles No.2-28 has been estimated to be  $B2 = +171.70 \text{ mm} \pm 49 \text{ mm}$  (20-Hz, GDR data) and  $B1 = +84.29 \text{ mm} \pm 42 \text{ mm}$  (GDR-C) for Jason-1, cycles No. 209-259.
- Procedures of calibration have been standardized between Corsica, Harvest Platform and Gavdos.
- The altimeter calibration experiment is enhanced by the addition of another site (RDK1) on Crete and on the same ground track (No.109). A new tide gauge station (VEGA radar) collocated with a permanent GPS receiver has been installed, there.
- Field sea surface campaigns are being planned using a survey boat along passes No. 018 and 109 around Gavdos to validate the used geoid models.

## ACKNOWLEDGMENTS

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