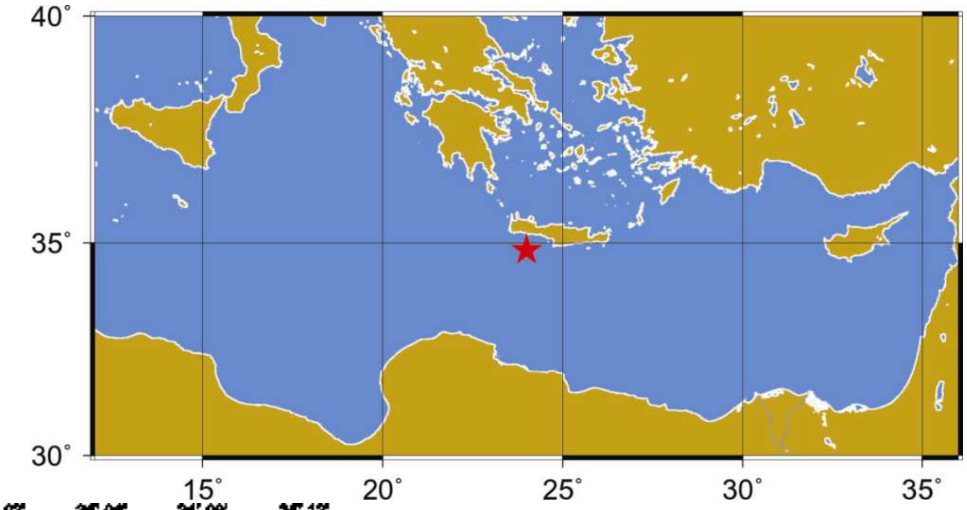
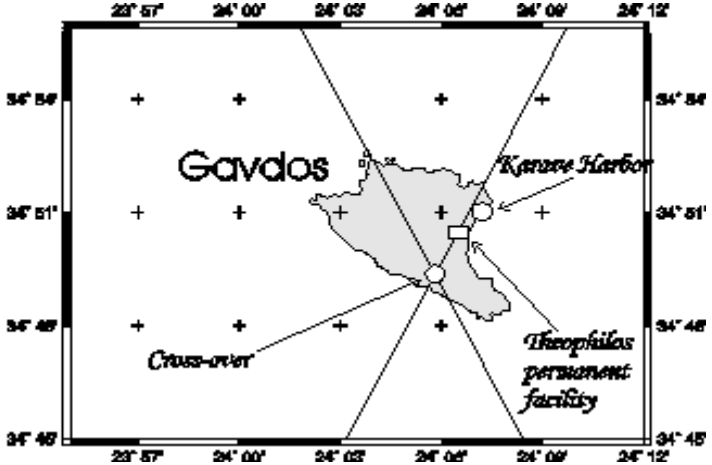
Latest absolute calibration results for Jason-2 and HY-2 satellites using the Gavdos/Crete permanent calibration facilities

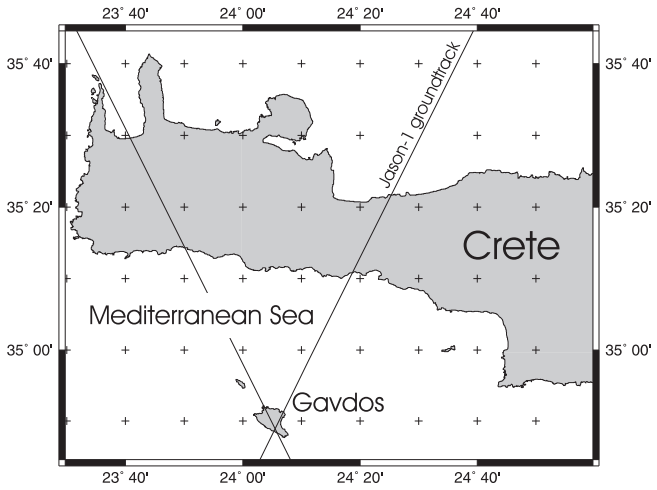
S. P. Mertikas[1], A. Daskalakis[2]; I.N. Tziavos[3]; G. Vergos[3]; H.L. Peng[4]; X. Zhou[5]; F. Qiao[5]; V. Zervakis[6].

[1] Technical University of Crete, , Greece;
[2] Space Geomatica Ltd. , Greece;
[3] Aristotle University of Thessaloniki, Greece;
[4] National Ocean Satellite Applications Service, China;
[5] First Institute of Oceanography, China;
[6] University of the Aegean, Greece.

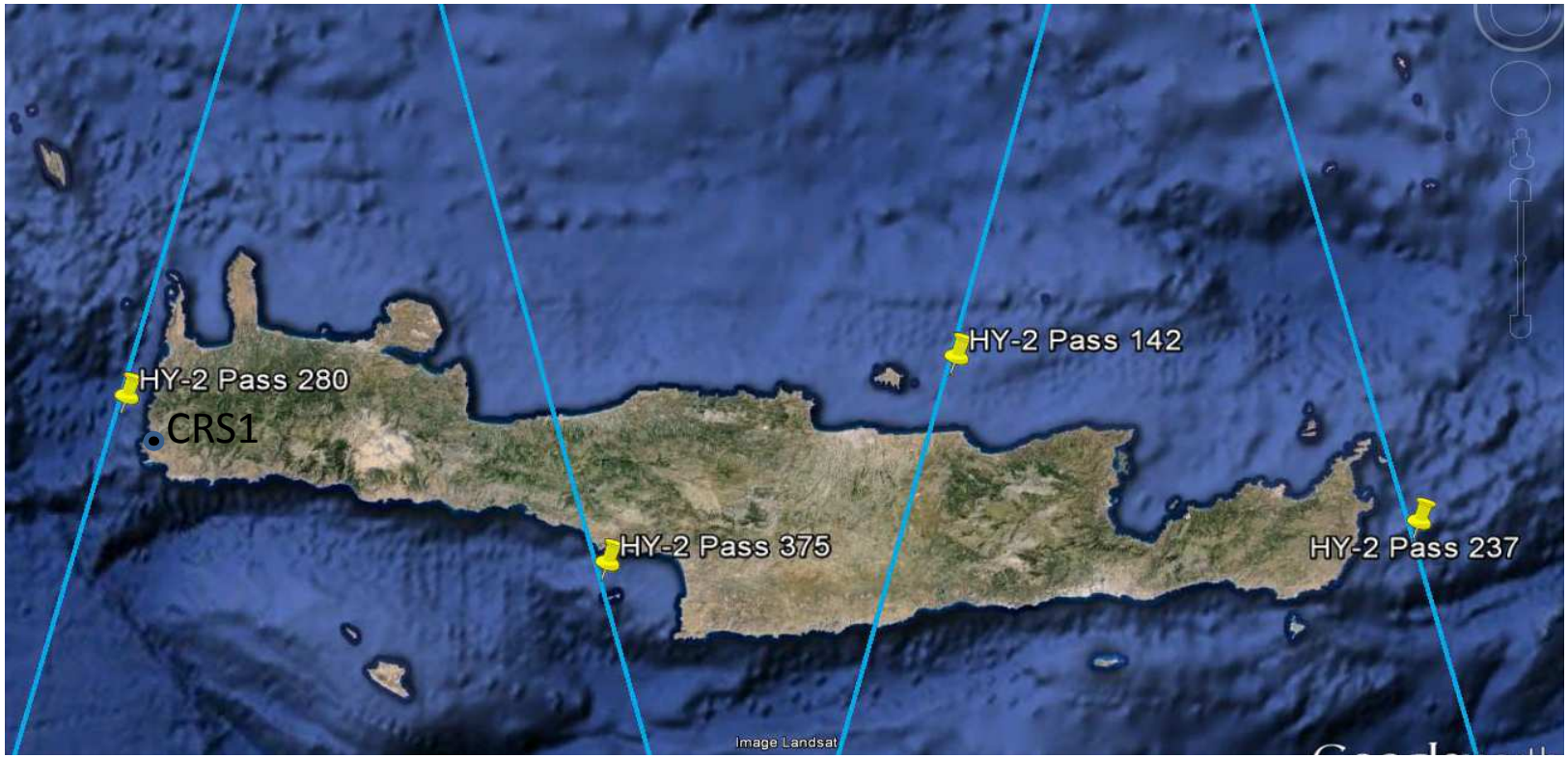
Gavdos Permanent Facility







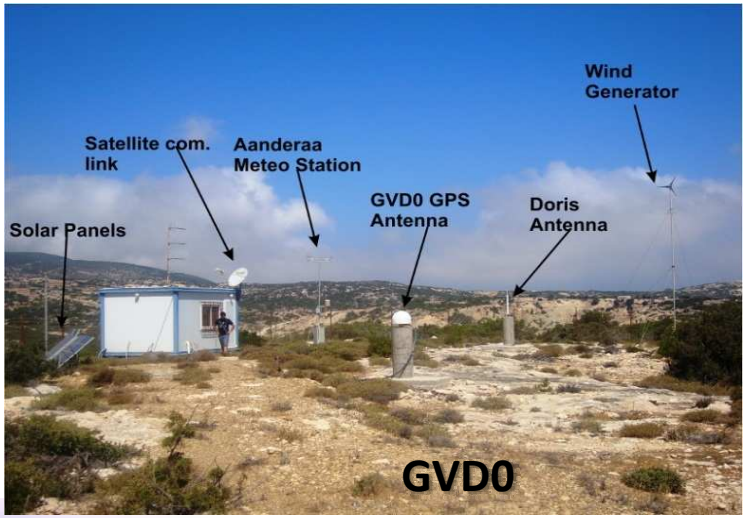
HY-2 Ground tracks over Crete

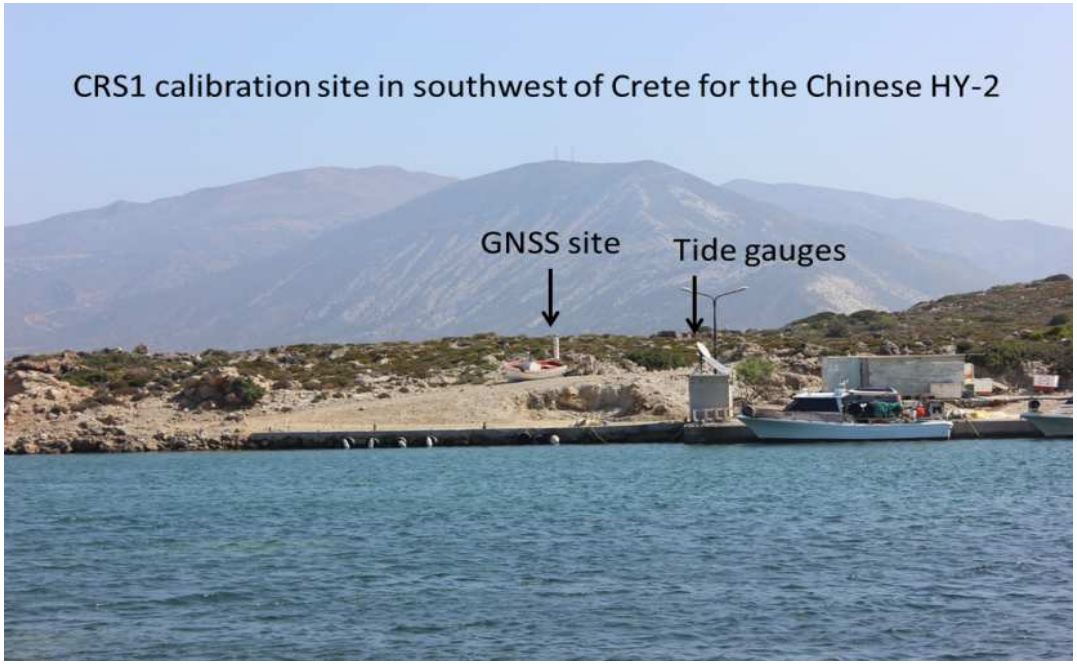


- **CRS1 is the Cal/Val site for HY-2, Only 10 km away from PCA,**
- **South & north track for HY-2 calibration.**

Gavdos and West Crete Facilities

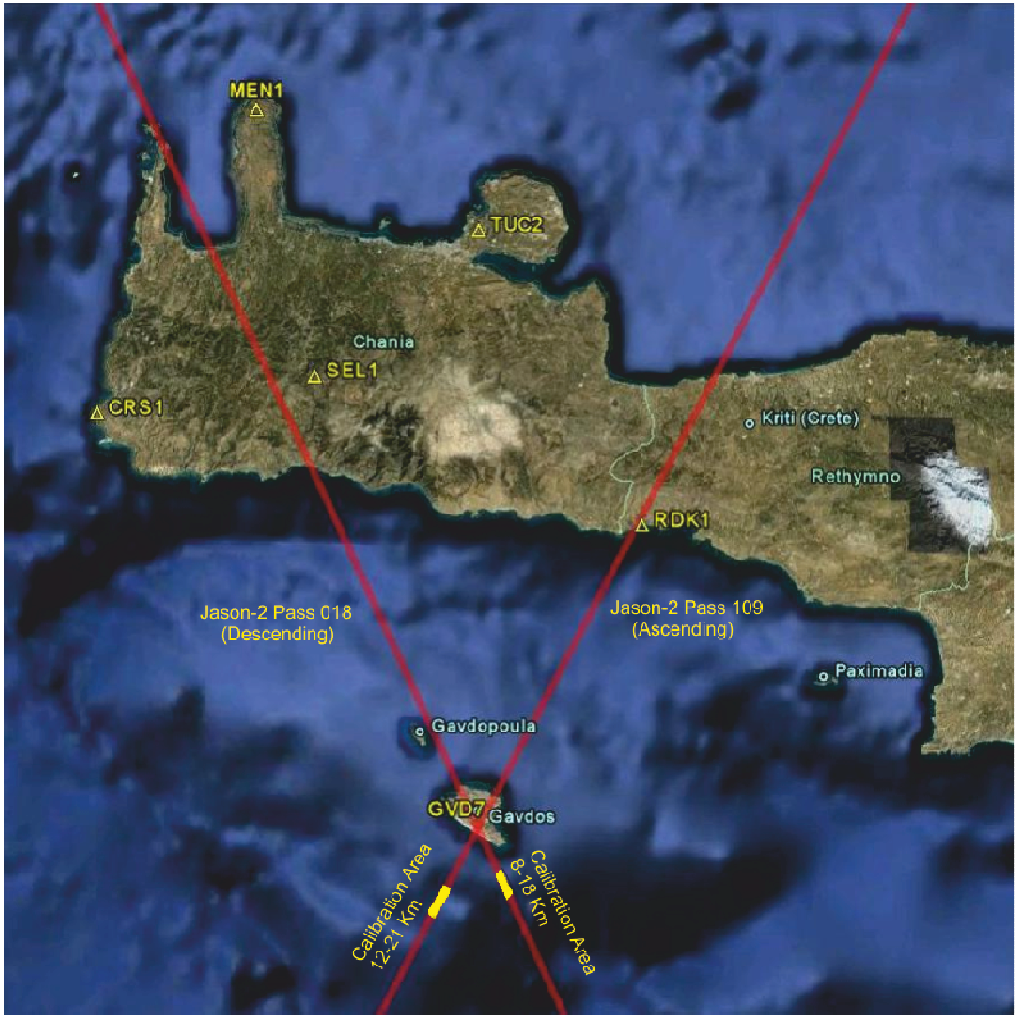
GeoMatLab



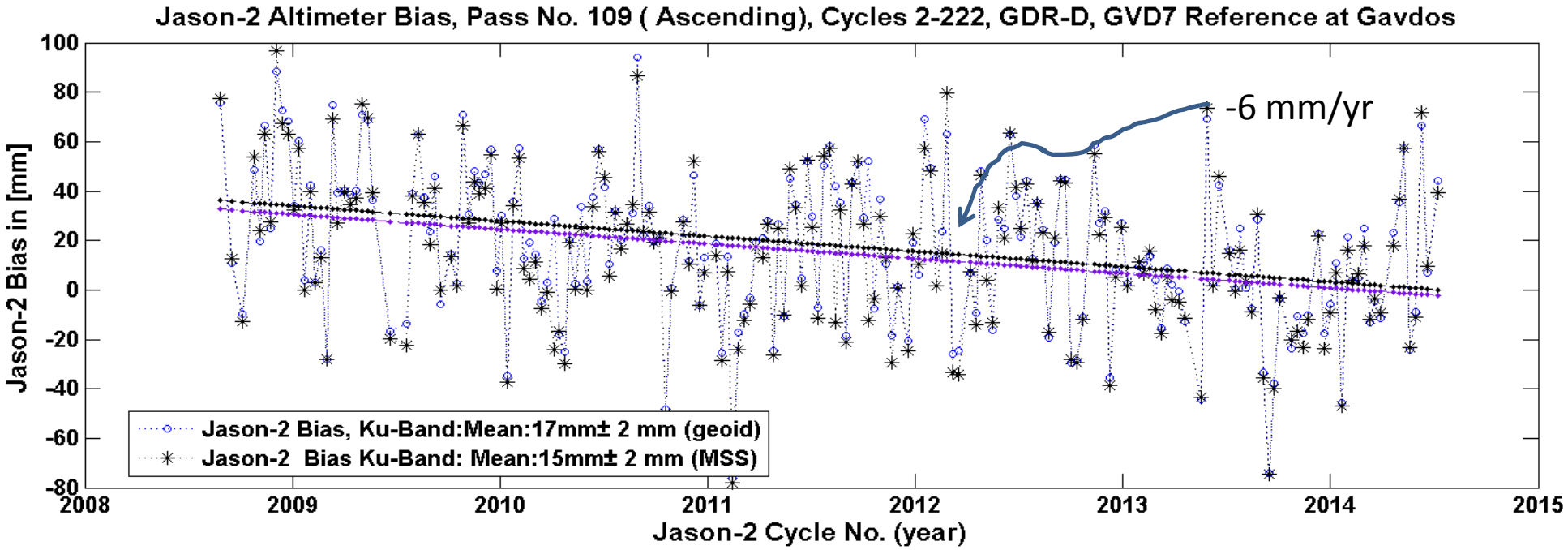


CRS1 in southwest Crete

Jason-2 Calibrating regions

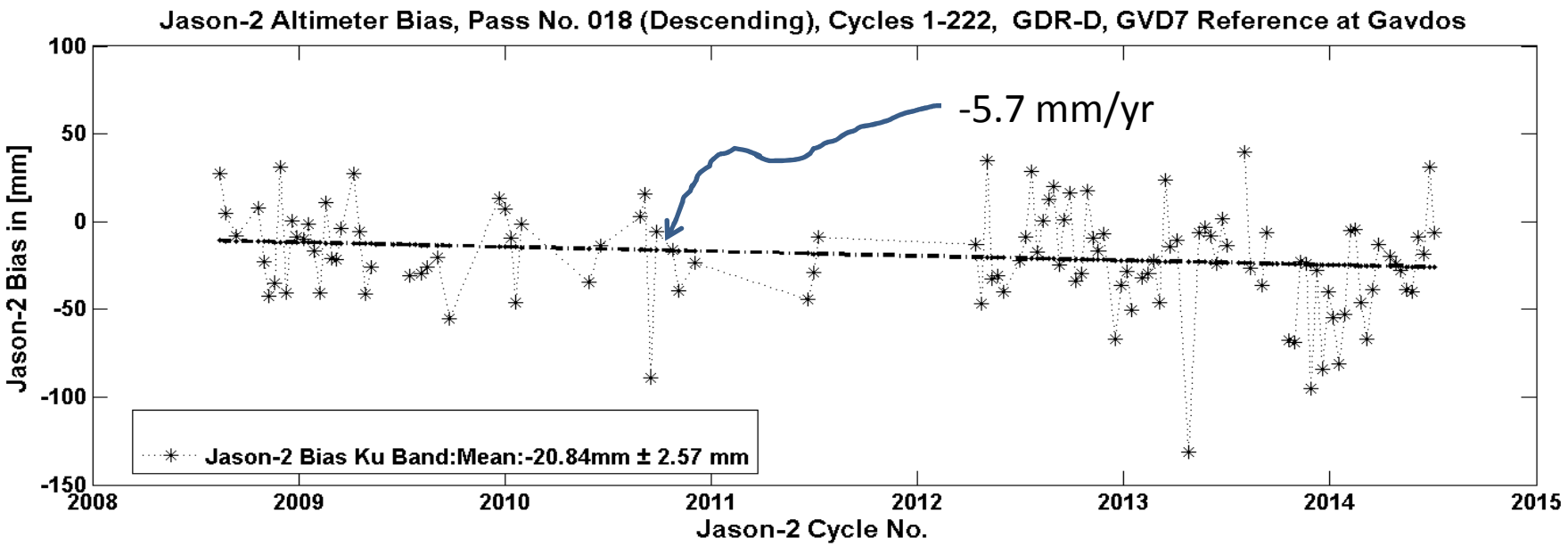


Jason-2 bias, Ascending pass No.109



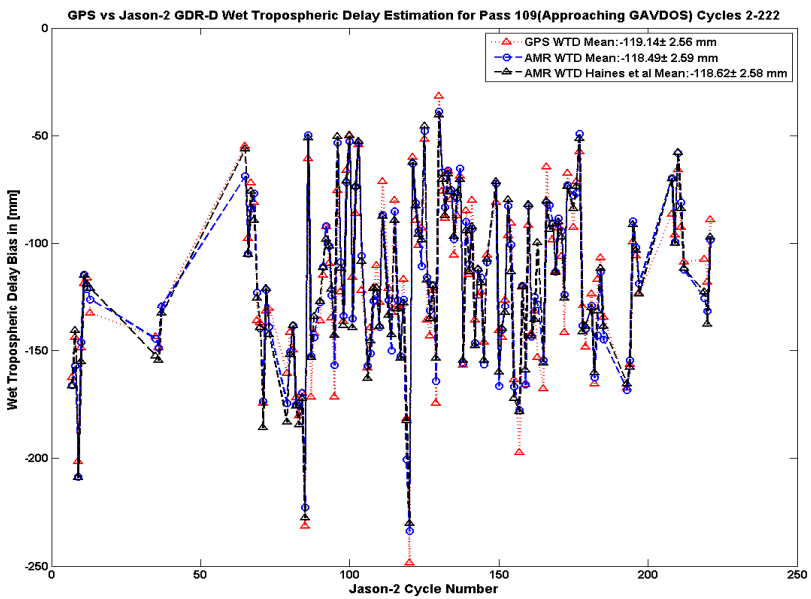
- Ascending Pass No.109, GDR-D , Cycles: 2-222;
- Calibration region **14.5km-24 km;**
- **Bias= +17 mm** ±2 mm, using local gravimetric geoid model;
- Bias= **+15 mm** ±2 mm, using altimetric MSS reference.
- Transponder Calibration over No. 109 in 2010-2011 (**Bias=+28.4cm**)

Jason-2 bias, Descending pass No.18

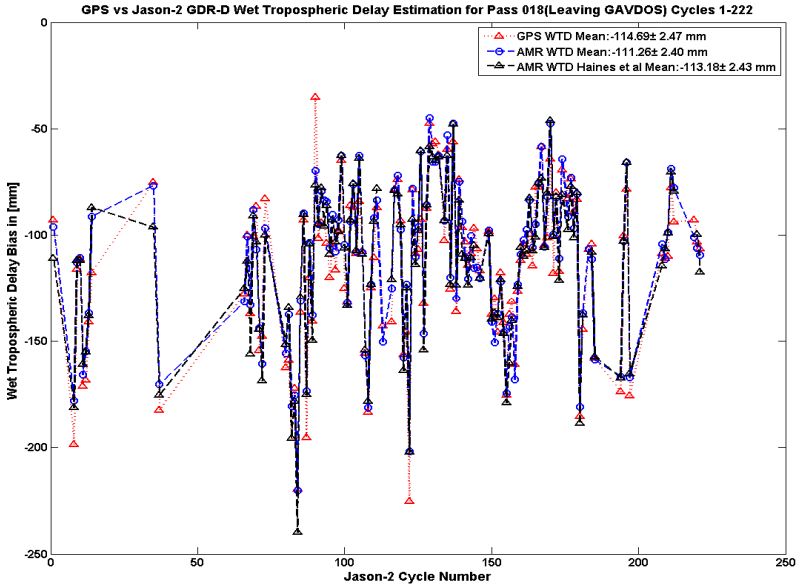


- Descending Pass No. 18, GDR-D , Cycles: 2-222;
- GOCE dynamic topography; Cal region **9km-20 km**;
- Bias= **-20 mm** ±2 mm
- Transponder Calibration over No. 18 in 2010-2011 (**Bias=+25.48cm**)

Wet troposphere delays



Pass **No. 109**, **Ascending;**
[AMR]-[GNSS wet tropo]= **-1mm ±2mm**;
Meteo sensor site data.



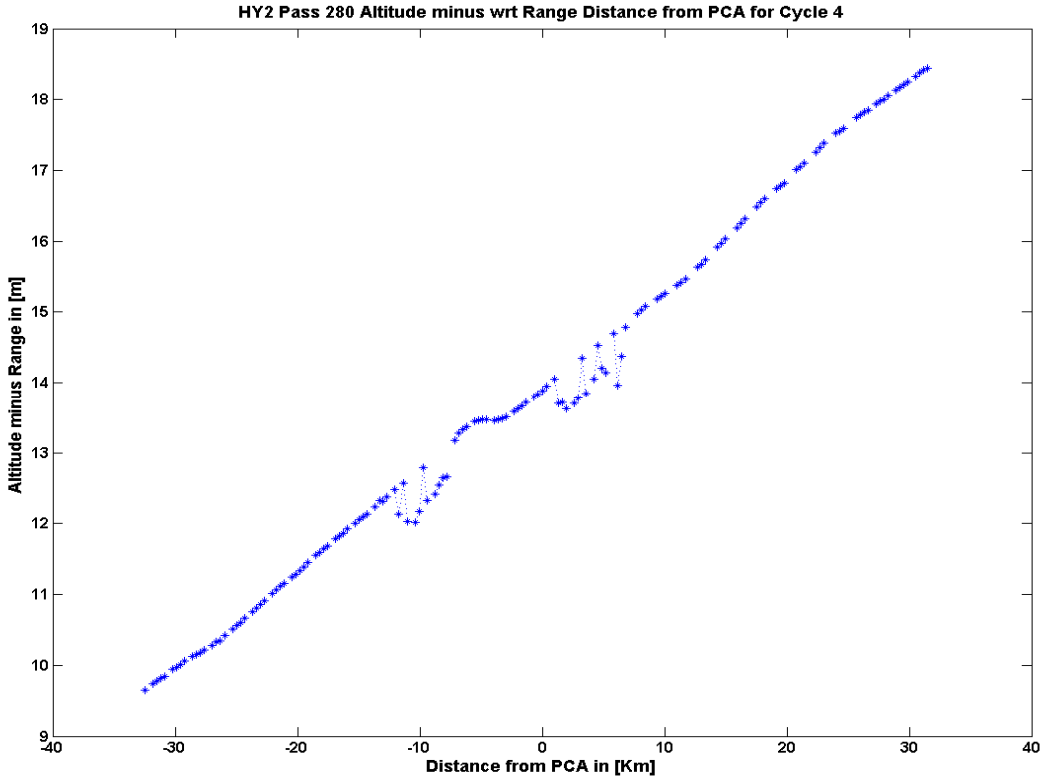
Pass **No. 18, Descending;**
[AMR]-[GNSS wet tropo]= **+1mm ±2mm**;
Meteo sensor site data.

Calibrating HY-2 using CRS1

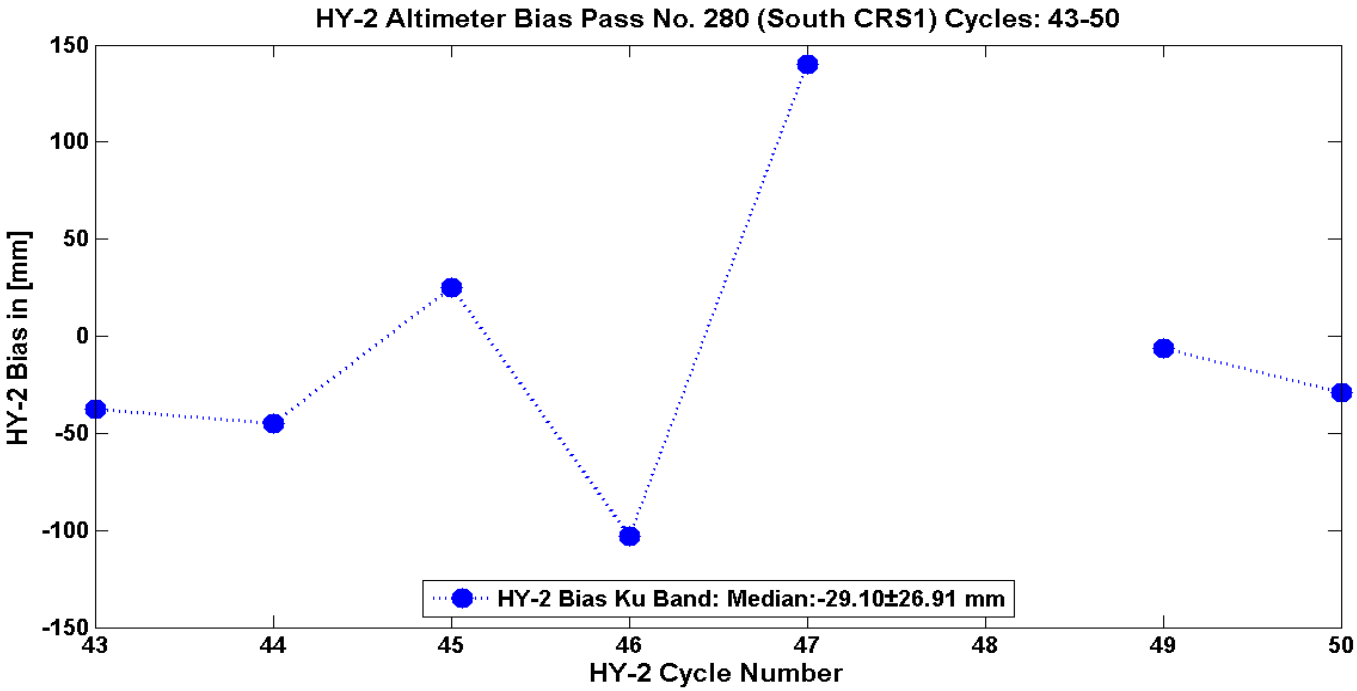
- I-GDR files: Cycle No. 19-22 (19 June-14 Aug, 2012);
- Models for ionosphere, dry and wet troposphere, and Sea State Bias.
- 1-Hz Data , Time-tagging problems, Missing values in orbit.
- **HY-2 Bias = +2.879 m** (Preliminary in 2012, Pass No.280)

HY-2 “Altitude(t)-Range(t)”, S-GDR

GeoMatLab

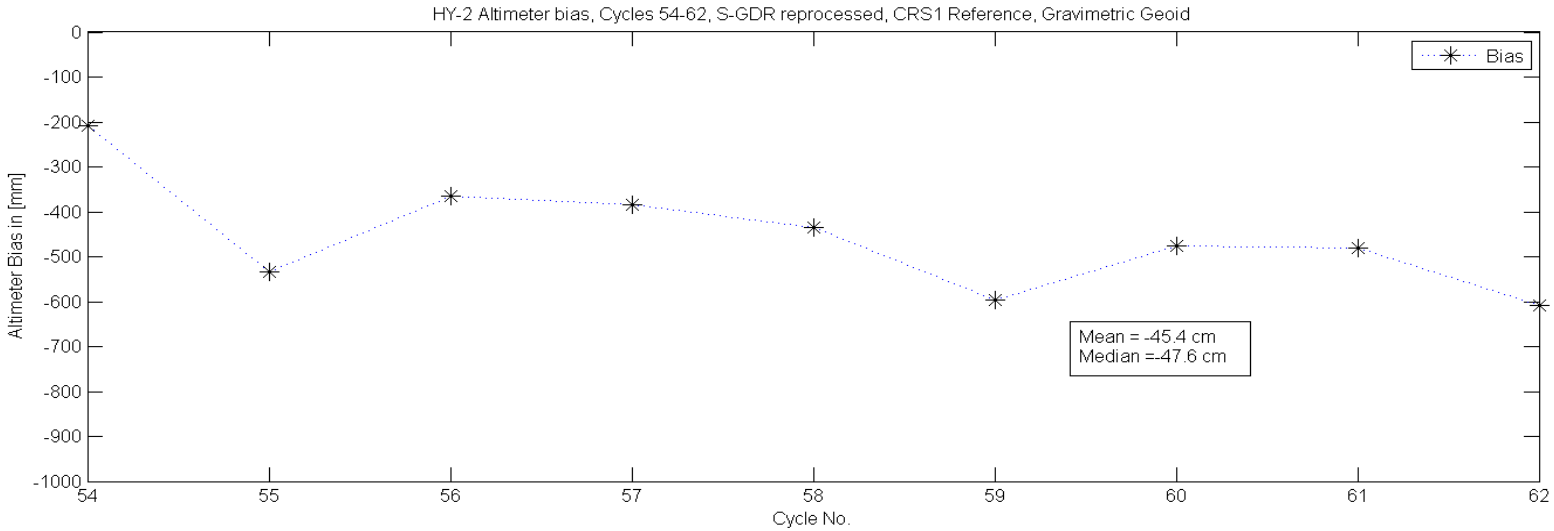


HY-2 altimeter bias



Cycles: 43-50, I-GDR data, 20-Hz, Cycle=48 contains no SSB,
Calibrating regions: **9-16 km (south), 10-18 km (north),**
Median bias= **-29 mm** ±27 mm, Mean = **-1.3 mm** ±40mm
Wet and dry tropo values from ECMWF model.

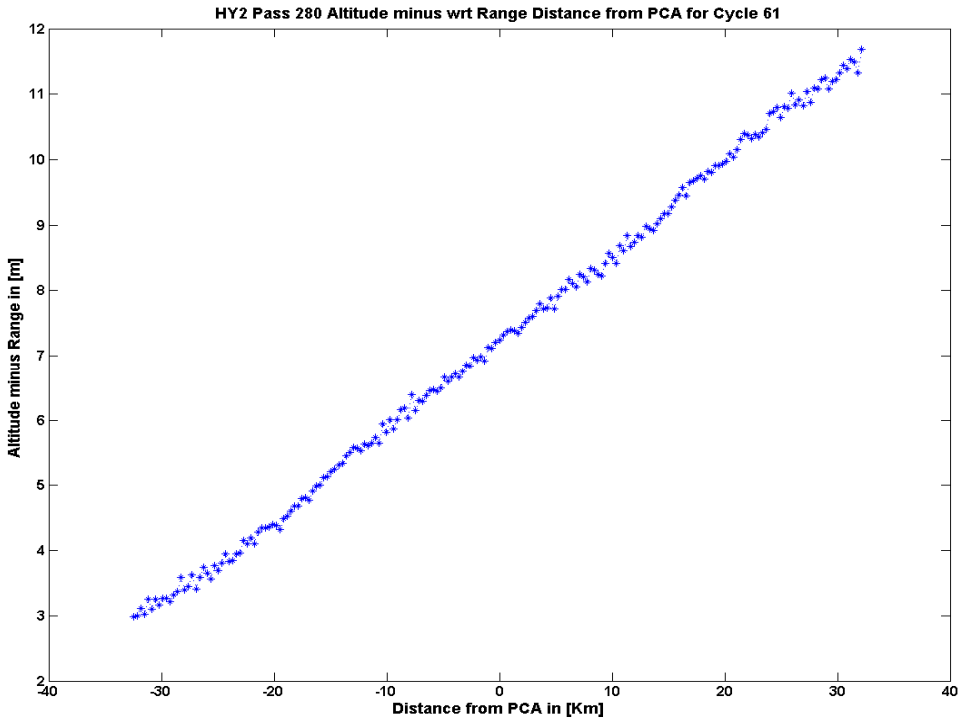
HY-2 altimeter Bias



- Bias = **-45.6 cm** (mean); **-47.6cm** (median)
- Cycles = 54-62,
- CRS1 Cal/Val site as reference in West Crete,
- Gravimetric geoid model.

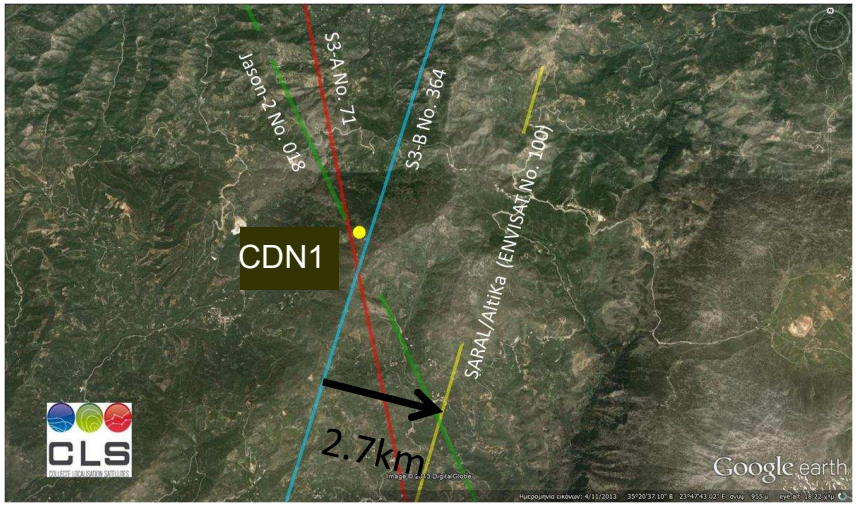
Now HY-2 GDR are reprocessed

GeoMatLab



- "Altitude(t)-Range(t)" around PCA of CRS1

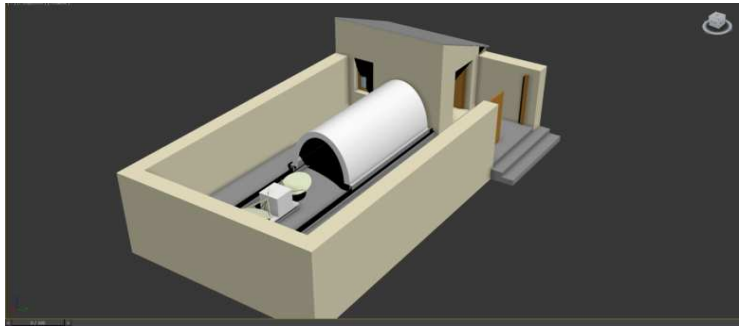
CDN1: Sentinel-3 Altimeter Calibration



- Transponder is now operational for Cryosat-2;
- Signal quality has been already tested with Jason-2.

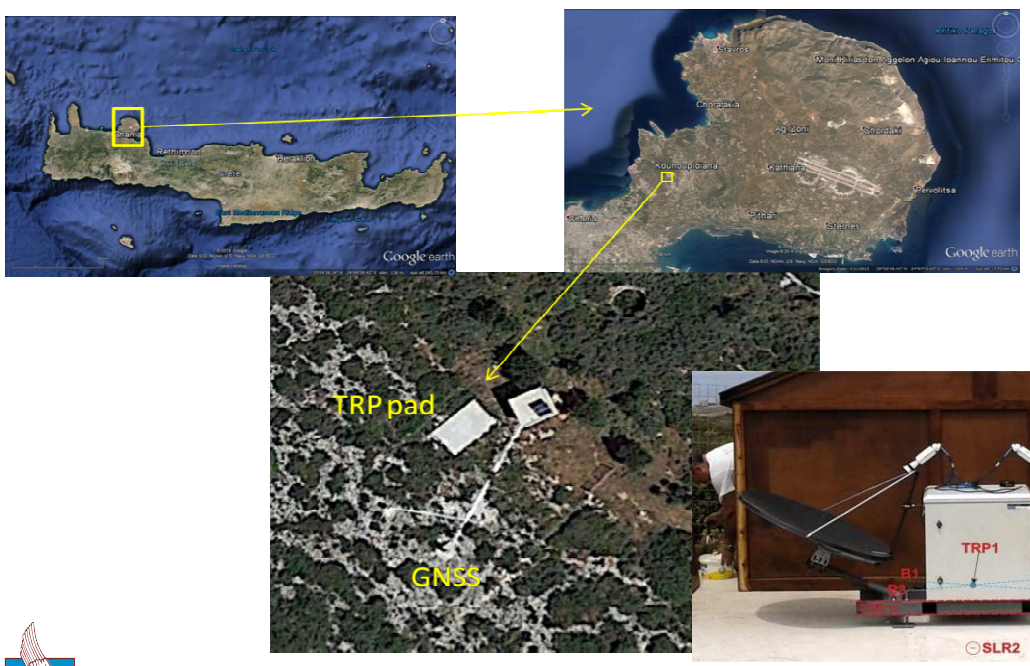
CDN1 Sentinel-3 Altimeter Calibration Site

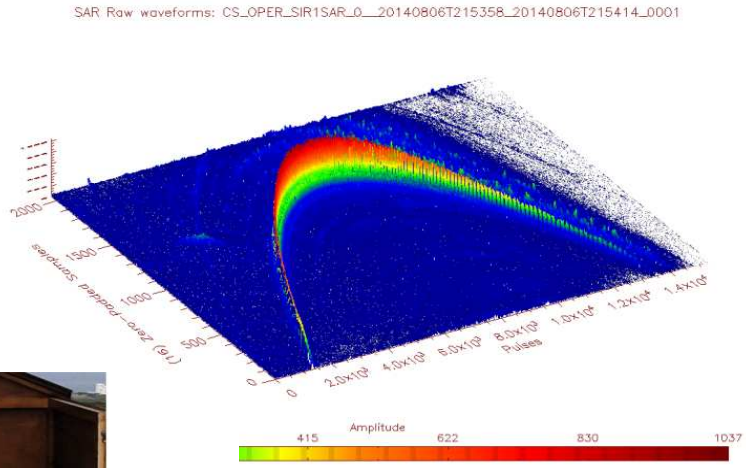
GeoMatLab



Cryosat-2 calibrations with the transponder

- The “CDN1” site will be fully operational in 2014 to calibrate Jason-2, Sentinel-3A, 3B (2015), Cryosat-2, and possibly SARAL/AltiKa;
- Transponder has been effectively used for Cryosat-2 calibrations at the “SLR2” site;
- Clear signal response even at 7km off ground track of Cryosat-2;





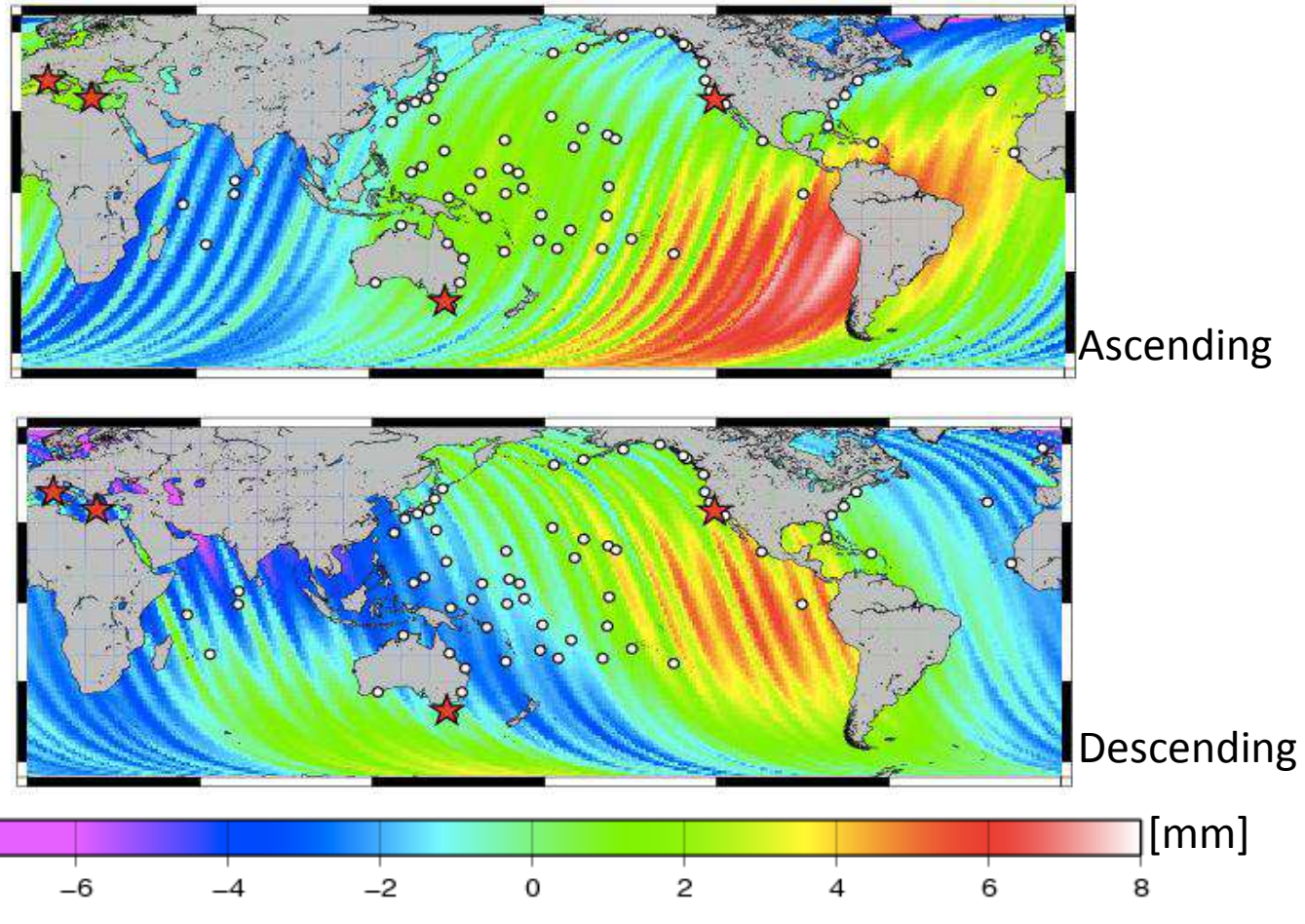
6 October 2014, 07:06:06 UTC

Conclusions

- **Jason-2** altimeter bias (GDR-D, Cycle=2-222, Gavdos):
  - B(No.109)= **+17 mm** ±2 mm, [Ascending]; Trend (No.109) = -6mm/yr
  - **B(No. 18) = -20 mm ±2 mm, [Descending]; Trend (No.18) = -5 mm/yr**
  - Diff[No.18-No.109]= **37mm**, sea-surface calibration;
  - Diff[No.18-No.109]= **29 mm**, transponder calibration [2010-2011];
- Wet Troposphere , AMR against GNSS:
  - Pass No. 109 : **-1mm** ± 2 mm; Pass No. 18 : **+1mm** ± 2 mm;
- **HY-2** Calibration**: HY-2 data require further processing.**
- Transponder regularly calibrates now Cryosat-2;
- Permanent ESA transponder calibration site at CDN1 :
  - Operational for Jason-2 in 2014,
  - And for Sentinel-3 in the commissioning phase in 2015.

Ascending and Descending orbits

[OSTST Report 2013]



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- Jean-Damien Desjonquères,
- François Boy.