Low elevation data, downweighting and mapping function Orbit results

Spot-2,-4,-5,Envisat: 4 series of 4 weeks (23/12/2007 – 19/01/2008)

Studies cases :

Case 1: Guo&Langley MF; without data < 12° ; with dow nweighting (LCA current processing)
Case 2: Guo&Langley MF; with data < 12°; without downw eighting

Case 3: Guo&Langley MF; with data < 12°; with downweig hting

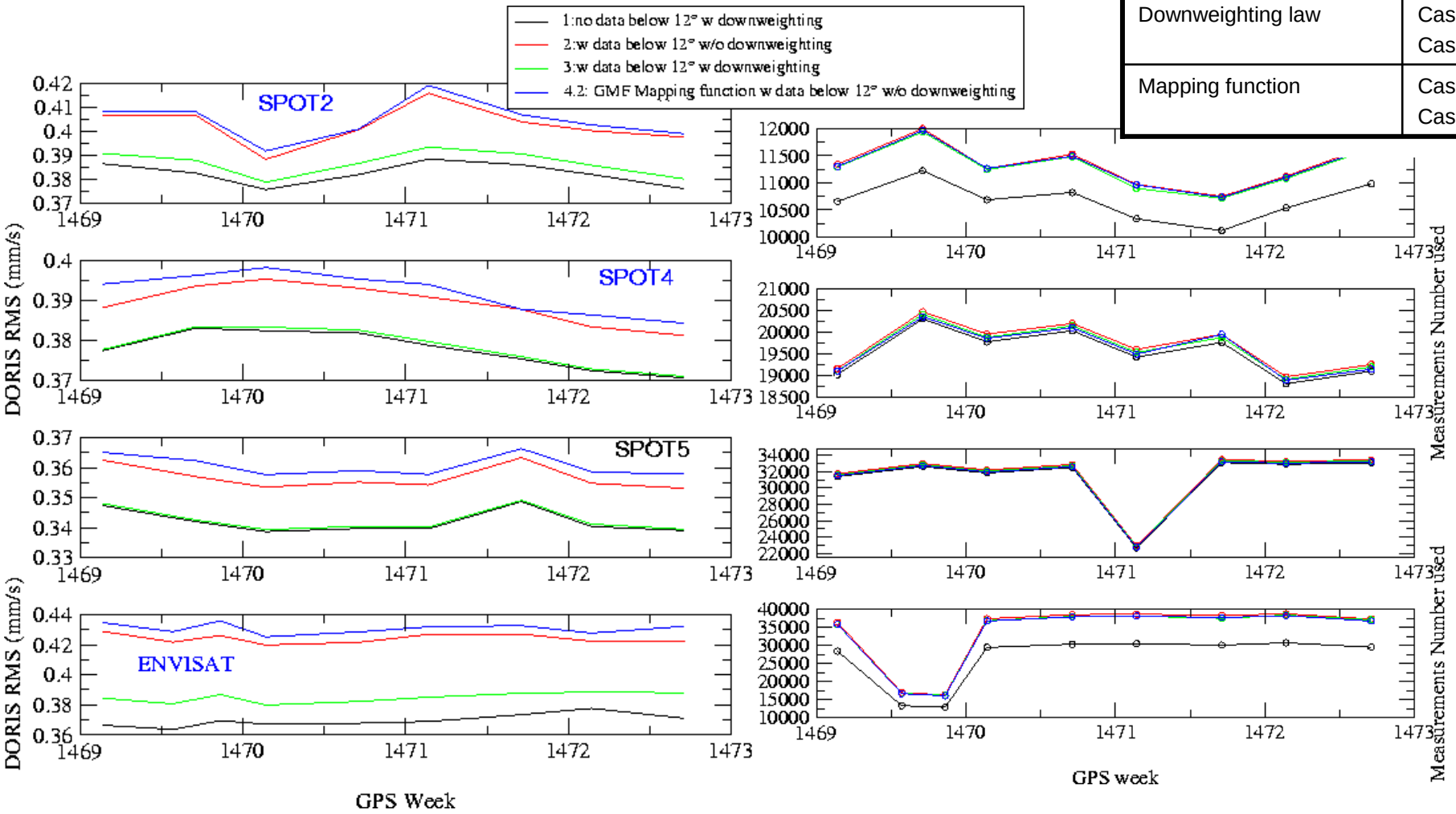
Case 4.2: GMF ; with data < 12°; without downweighti ng

Cross-comparisons:

Low elevation data < 12 dg	case 1 = w/o data < 12 dg case 3 = with data < 12 deg
Downweighting law	case 3 = with downw. case 2 = w/o downw.
Mapping function	case 2 = Guo&Langley case 4 = GMF

Post-fit rms and number of measurements

Low elevation data < 12	case 1 (black)= w/o Case 3 (green)= with
Downweighting law	Case 3 (green)= with Case 2 (red) = w/o
Mapping function	Case 2 (red) = G&L Case 4 (blue)= GMF



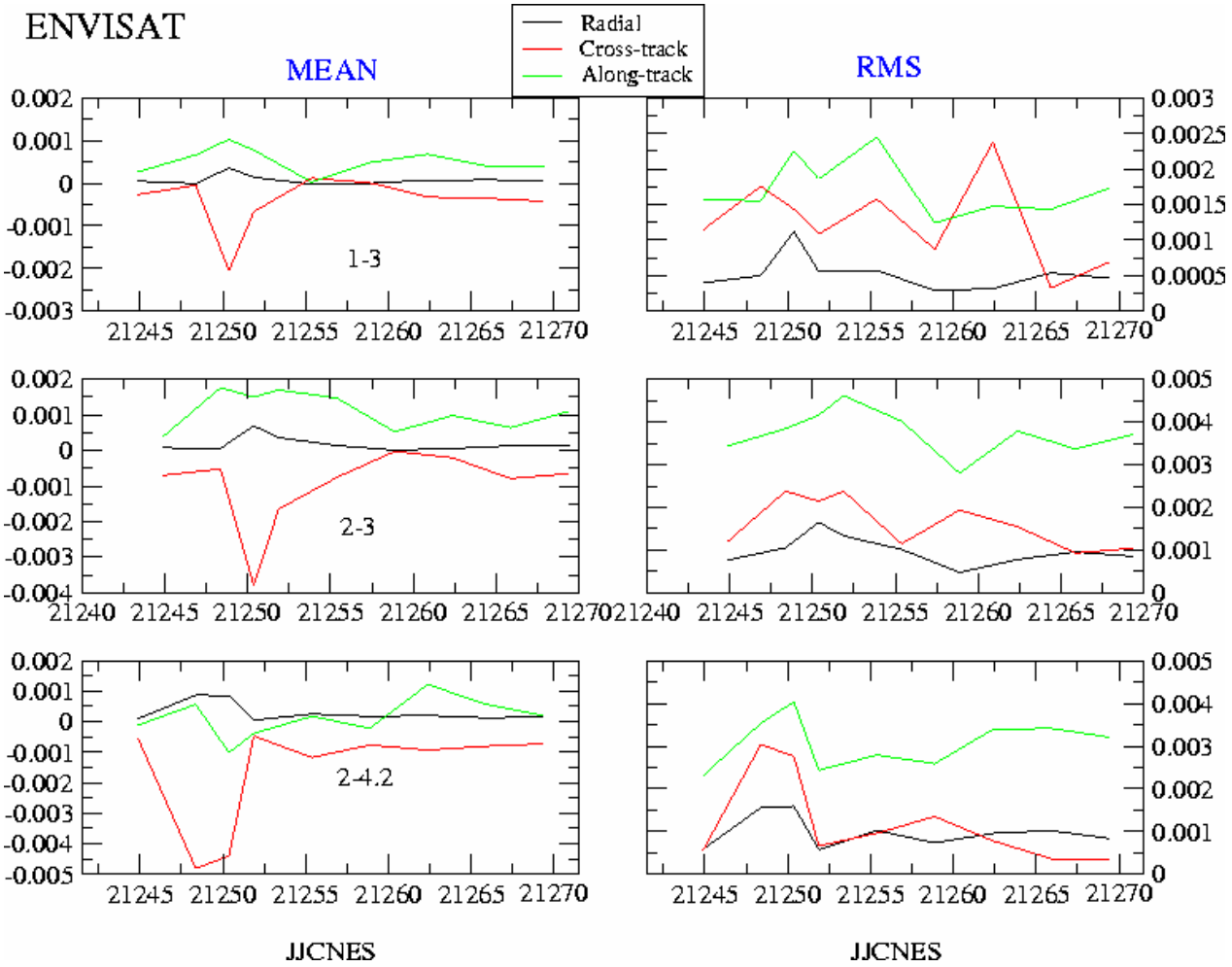
Spot2 and Envisat: Higher RMS with data < 12 °(no data below 12 for Spot-4 and -5)
All satellites: Higher RMS with GMF (red vs blue curves)

Orbit comparison

Low elevation data

Downweighting

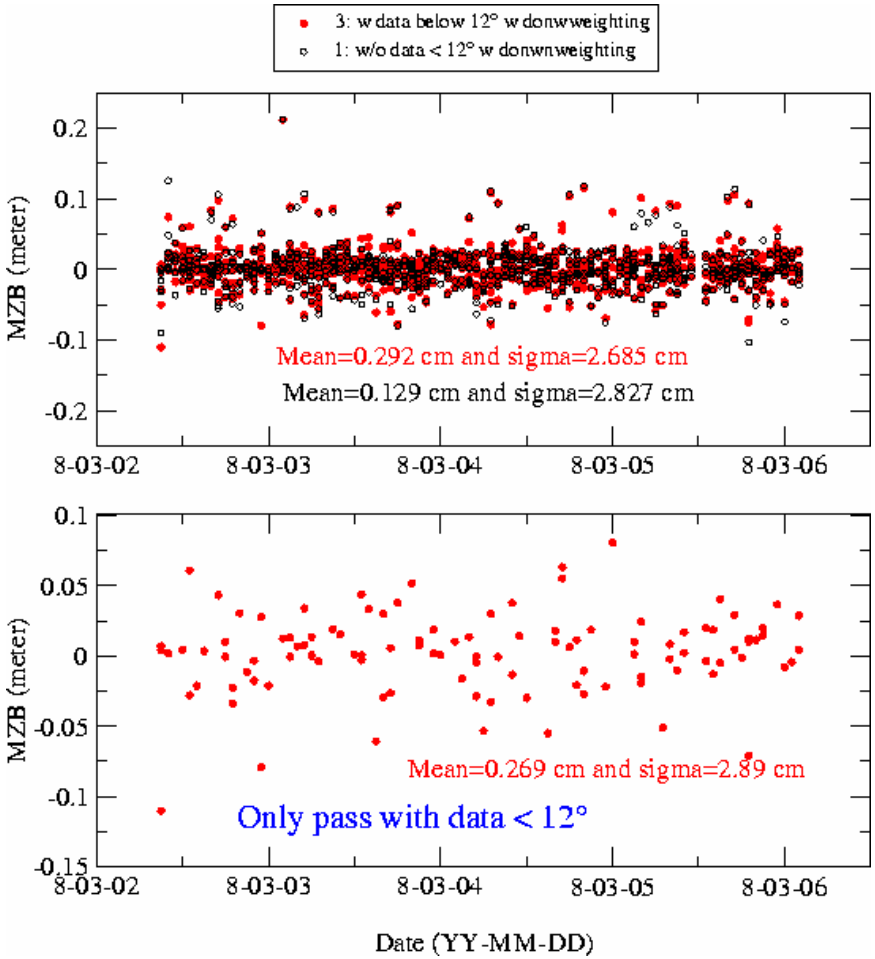
Mapping function



No significant differences (RMS and Average <5mm).
Same conclusion for all the satellites

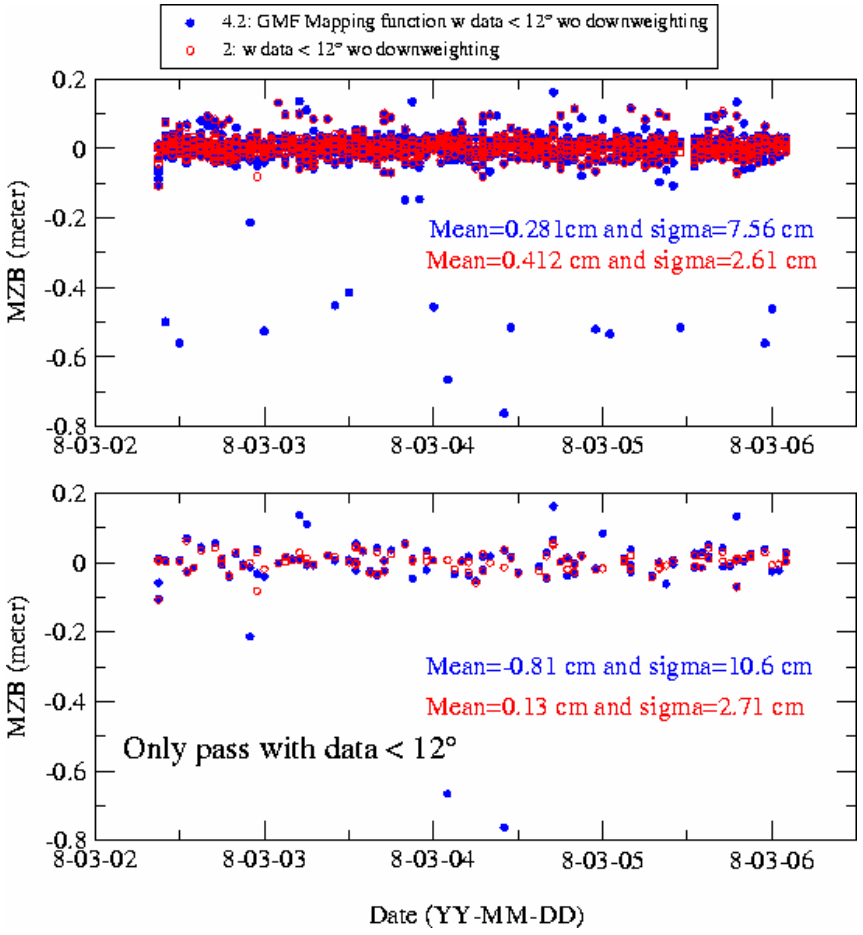
Tropospheric Bias adjusted per pass (MZB)

Low elevation effect :



No significant differences on MZB for low elev. data

Mapping Function effect :



Larger MZB with GMF for most stations, not particularly for low elev. data

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Conclusions:

Take into account data below < 12° :

- DORIS RMS larger of 0.01 mm/s
- possible with our Mapping Function (Guo & Langley) better than GMF
- only interesting for ENVISAT and SPOT2 (data available only for both satellites)
- no significant differences in orbit comparison
- no significant differences on tropospheric bias for low elevation data

Take into account downweighting:

- no significant differences in orbit comparison
- DORIS RMS larger of 0.03 mm/s

Is it really interesting to take into account low elevation data ?