



# **Contribution of the new DORIS/DGXX instruments to the geodetic products: First results with Cryosat-2**

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# The DORIS constellation

## 3 generations of DORIS instruments

1G (Spot-2,-3,-4, Topex) : 1 channel

2G (Envisat) and 2GM (Spot-5, Jason-1) : 2 channels

DGXX (Jason-2, Cryosat-2) : 7 channels

## 3 altitudes

Spot -2,-3,-4,-5 / Envisat: around 800 km

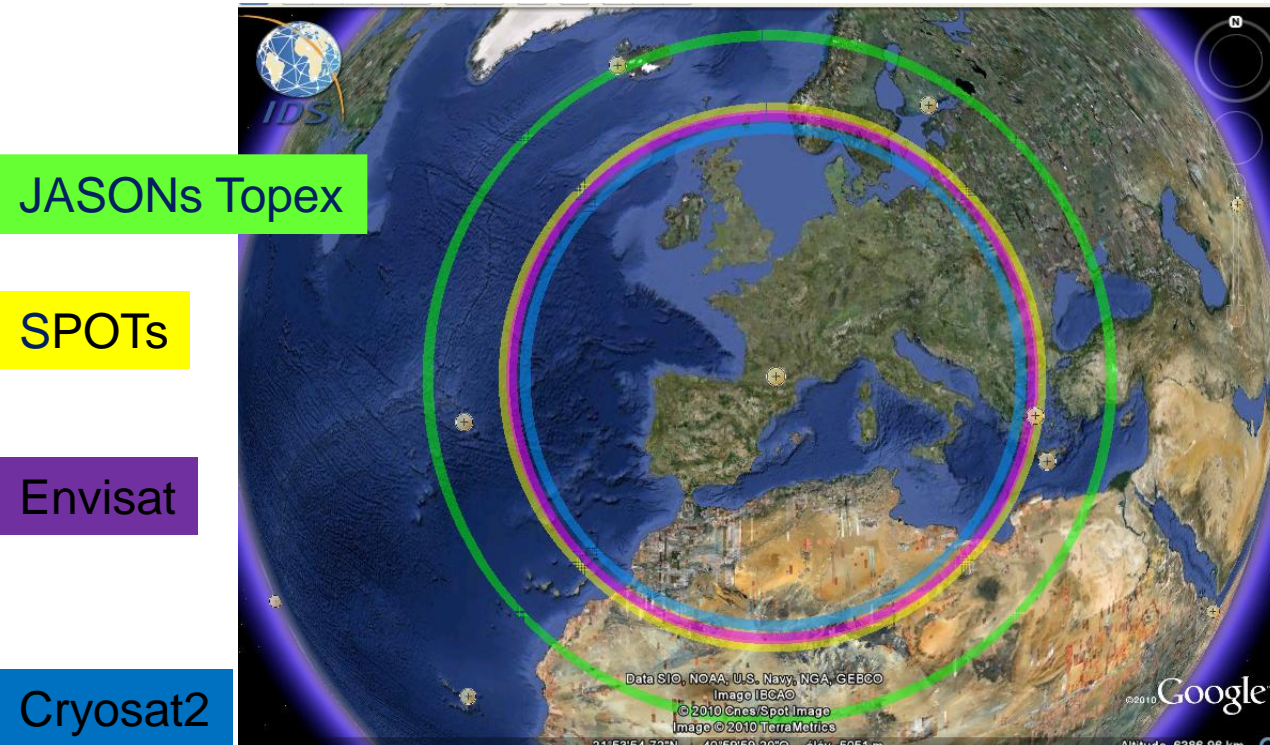
Topex / Jason-1/ Jason-2 : 1330 km

Cryosat-2 : 710 km

## 3 orbit planes

	SPOT/ENVISAT: 98°	TOPEX/JASON: 66°	CRYOSAT: 92°
1993-2004	Spot-2,-3/-4,-5; Envisat	Topex	-
2005-2008	Spot-2,-4,-5; Envisat	-	-
2008-2009	Spot-2,-4,-5; Envisat	Jason2	
2010-	Spot-4,-5; Envisat	Jason2	Cryosat2

# Visibility circles (12 deg.)

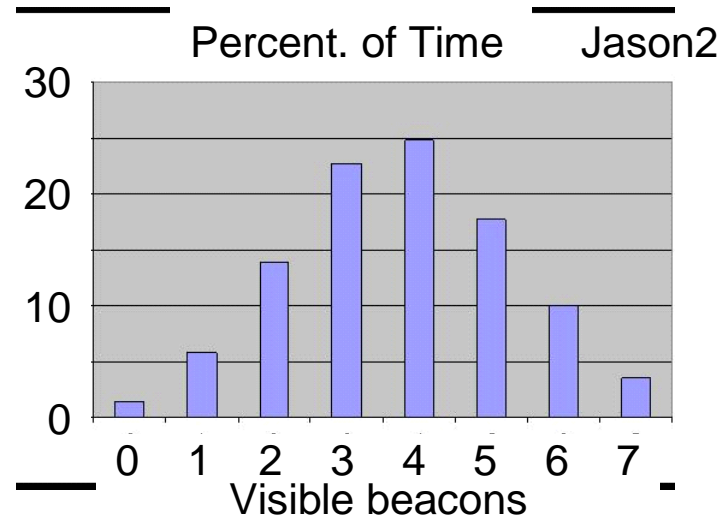


Jason2s Topex

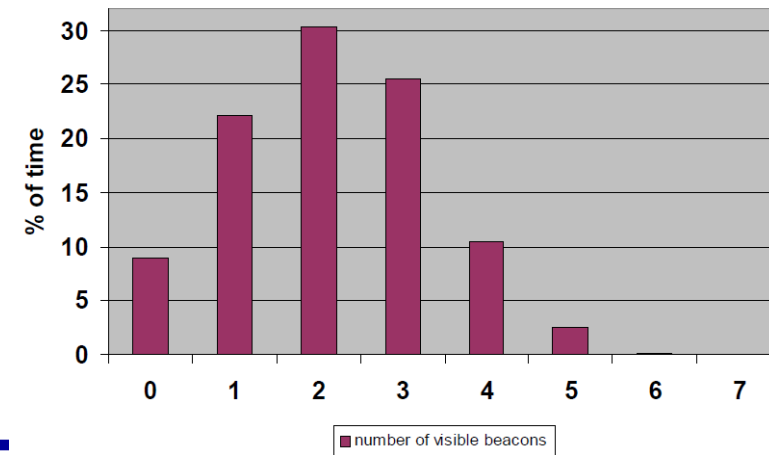
SPOTs

Envisat

Cryosat2

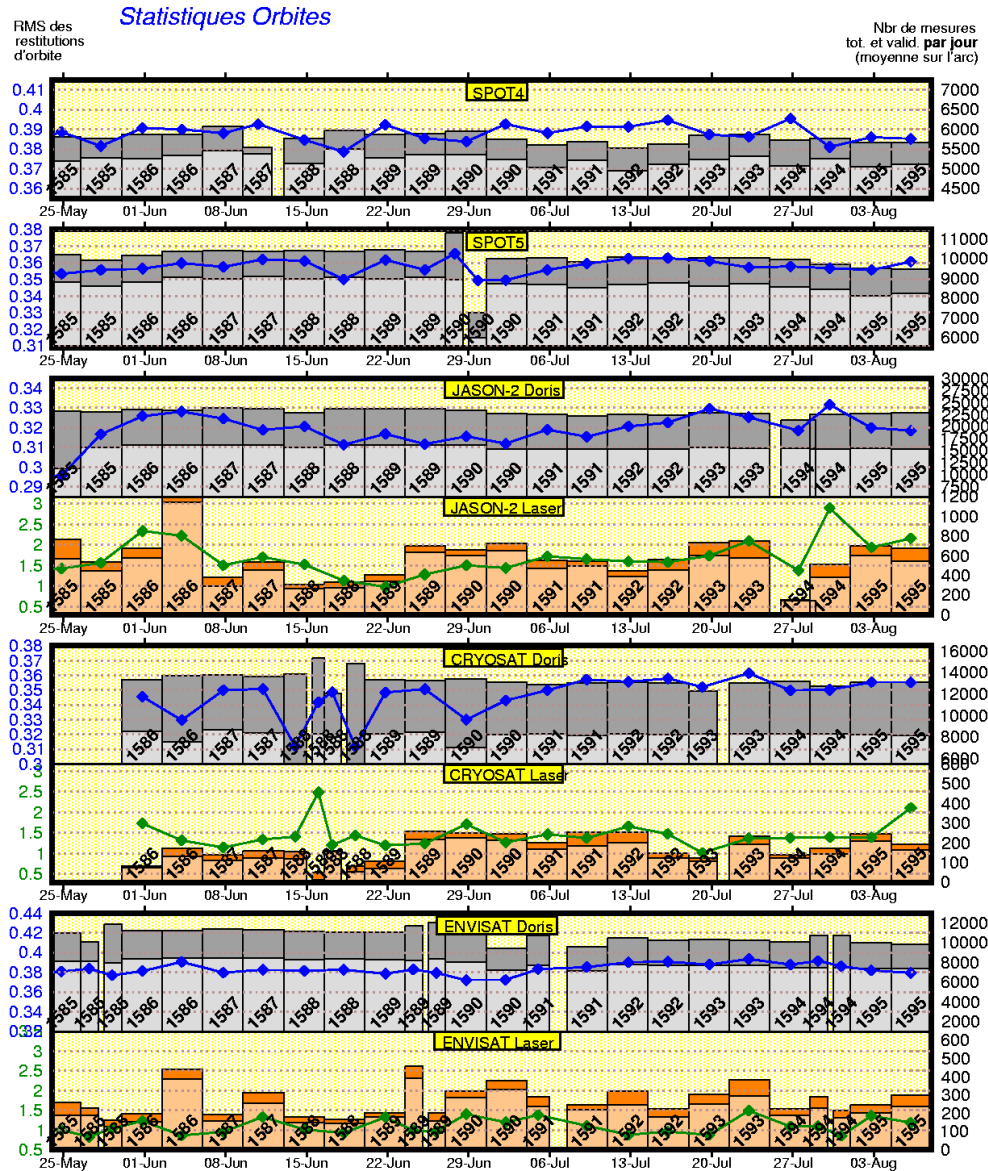


Visible beacons by DORIS Cryosat 2 Percentage of time (6 days)



# Orbit residuals

Cut-off 12 deg.



Spot4 0.39 mm/s

Spot5 0.36 mm/s

Jason2 0.32 mm/s

1.5 cm

Cryosat-2 0.36 mm/s

1.5 cm

Envisat 0.38 mm/s

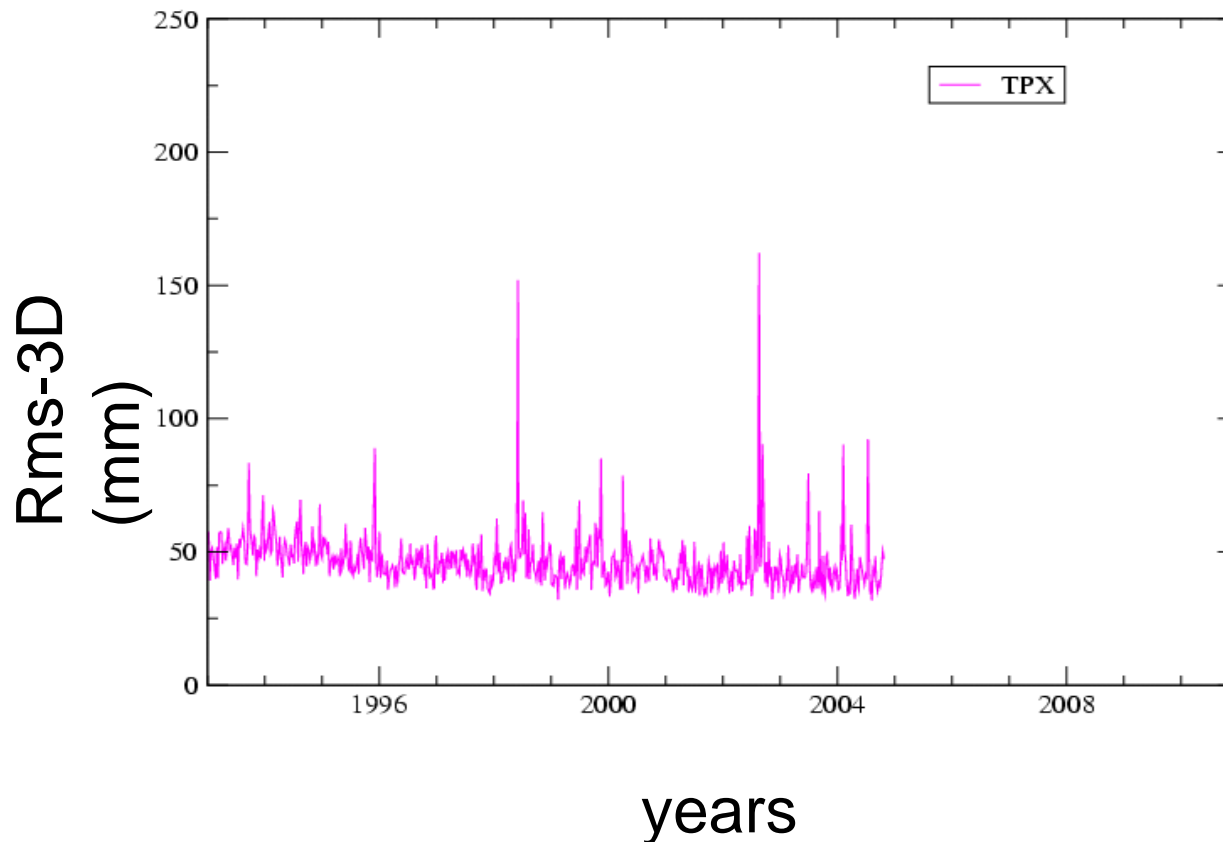
1 cm

DORIS/Cryosat2:  
~8000 validated data per day as for Spot-5 and Envisat

# **SINGLE SATELLITE SOLUTIONS**

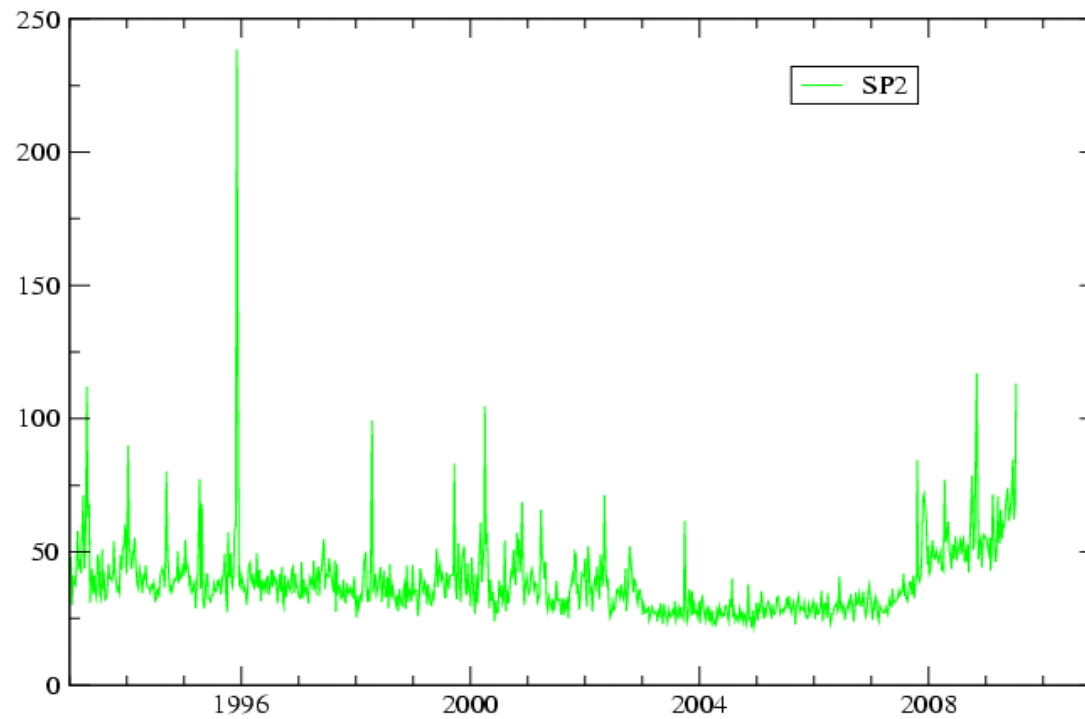
# Topex

Comparison of weekly solutions wrt DPOD2005  
Residual 3D-rms obtained after 7P transformations

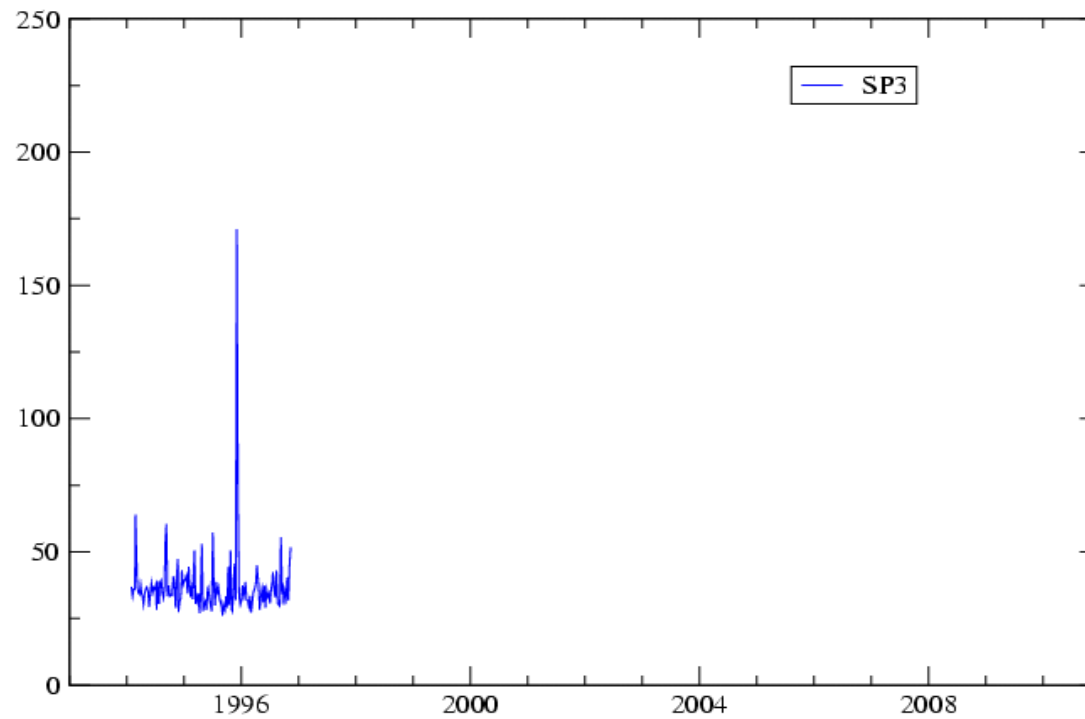


Peaks:  
-incomplete weeks  
(data gap)  
-solar events  
(geomagnetic storms)

# SPOT-2

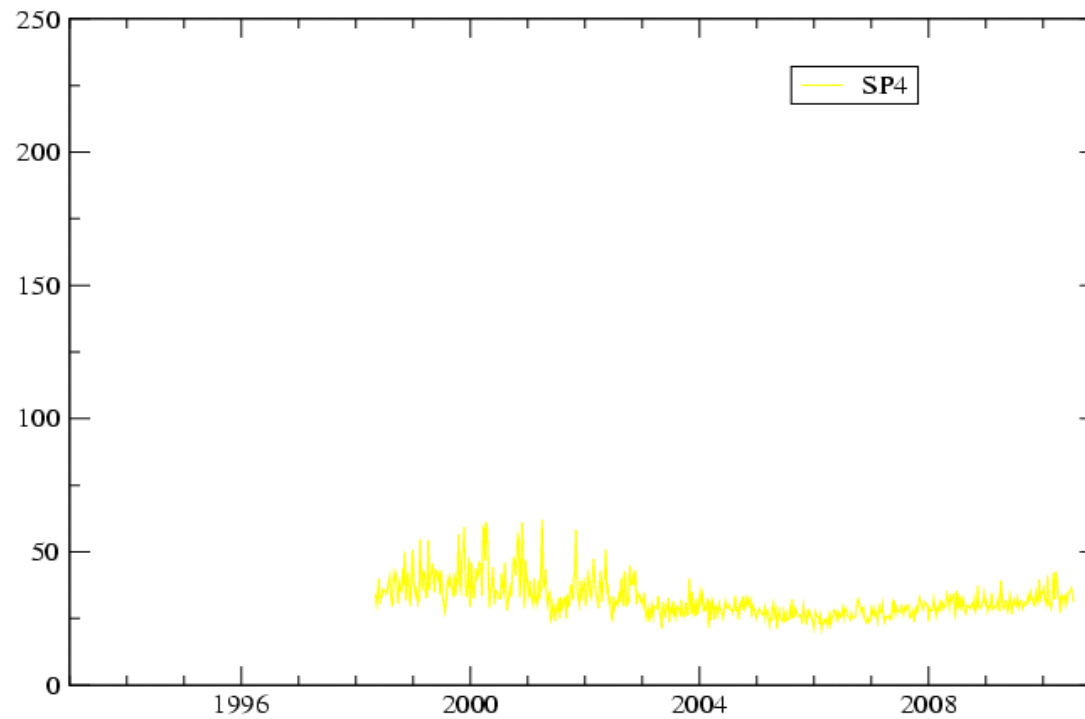


# SPOT-3

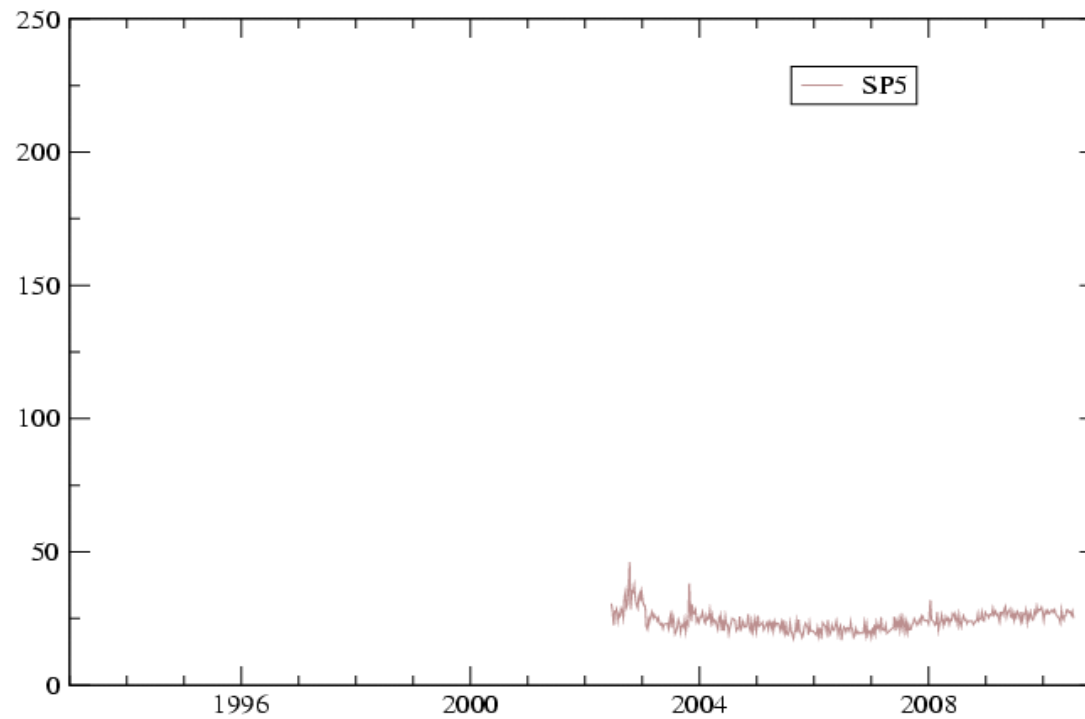




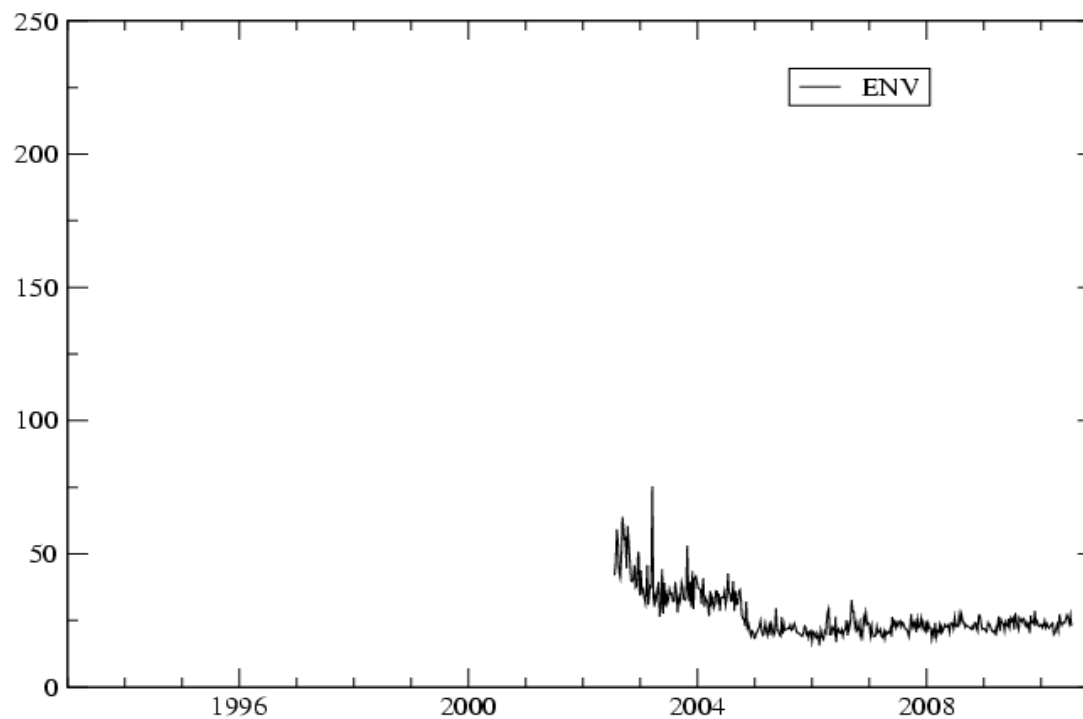
# SPOT-4



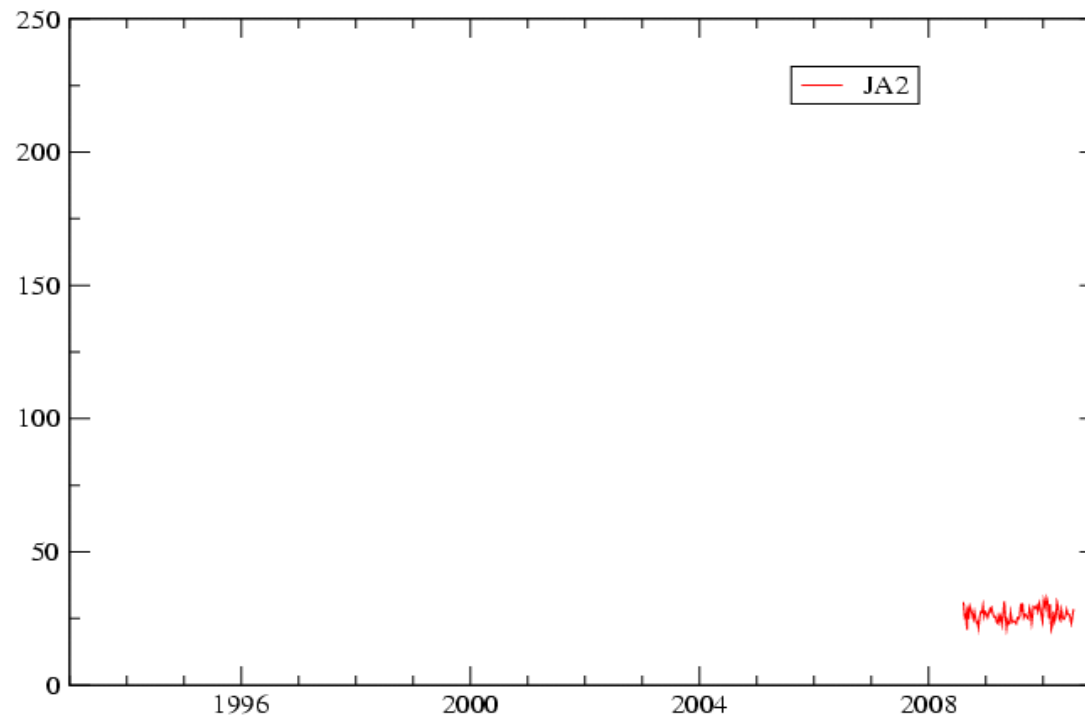
# SPOT-5



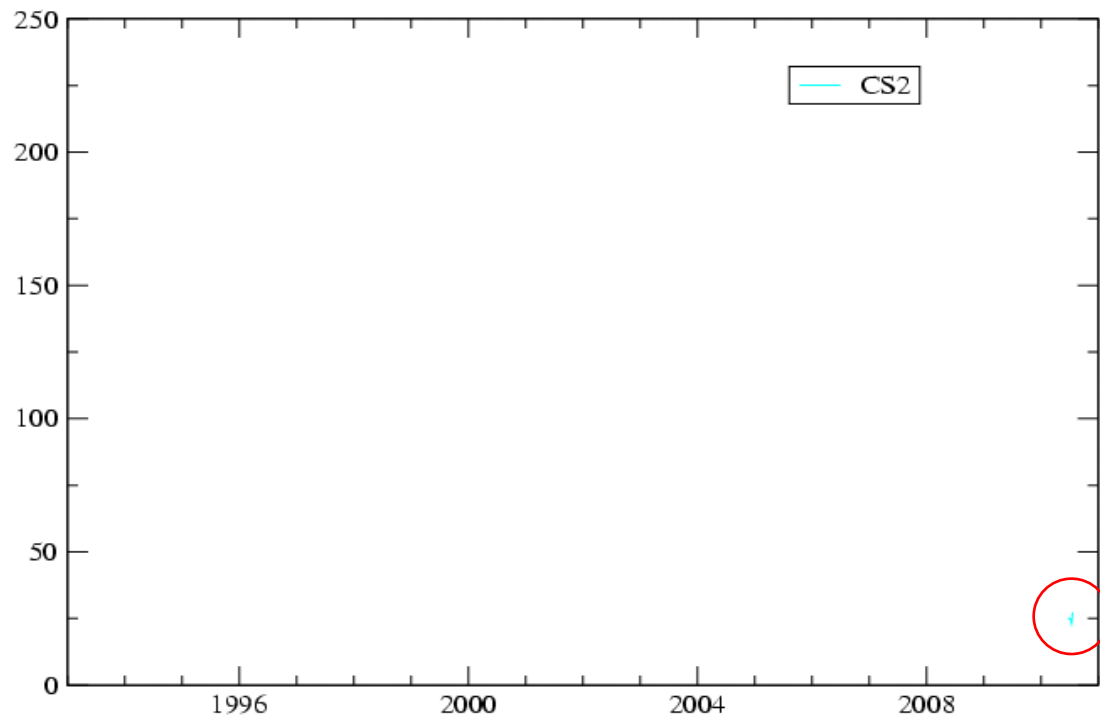
# Envisat



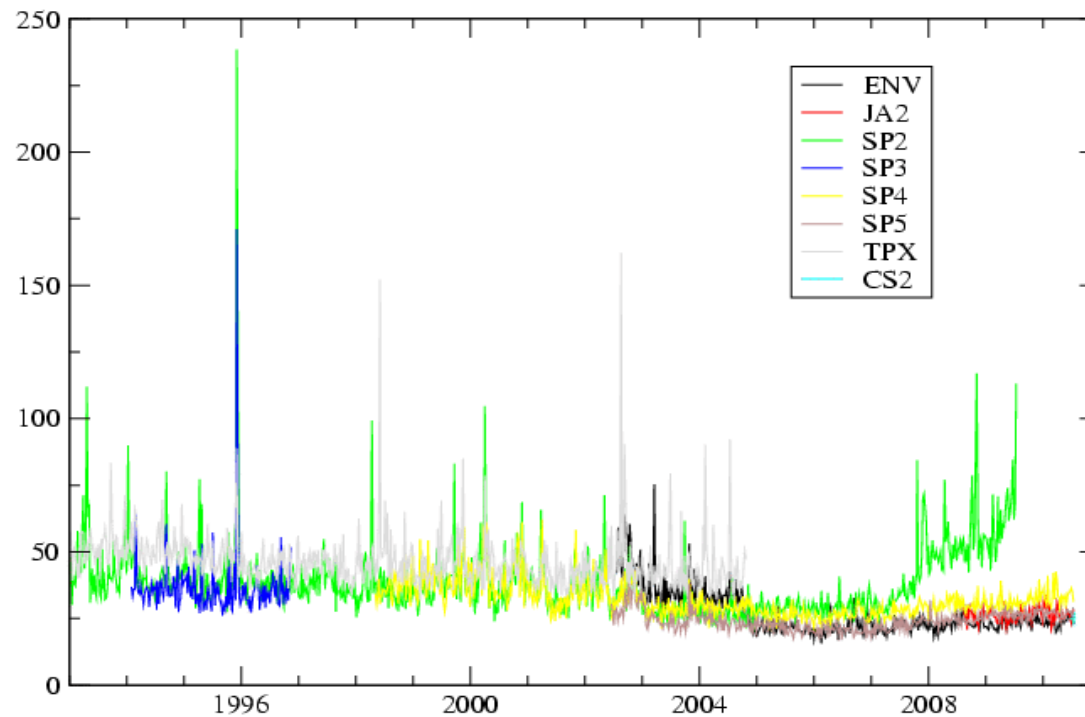
# Jason-2



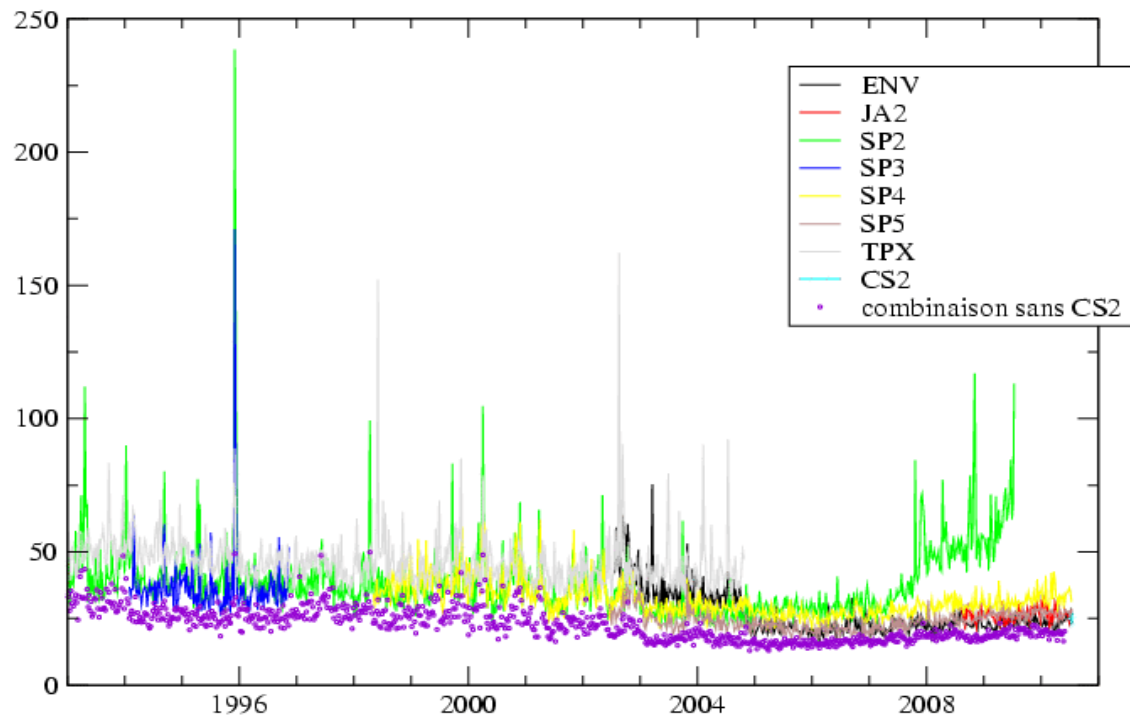
# Cryosat-2



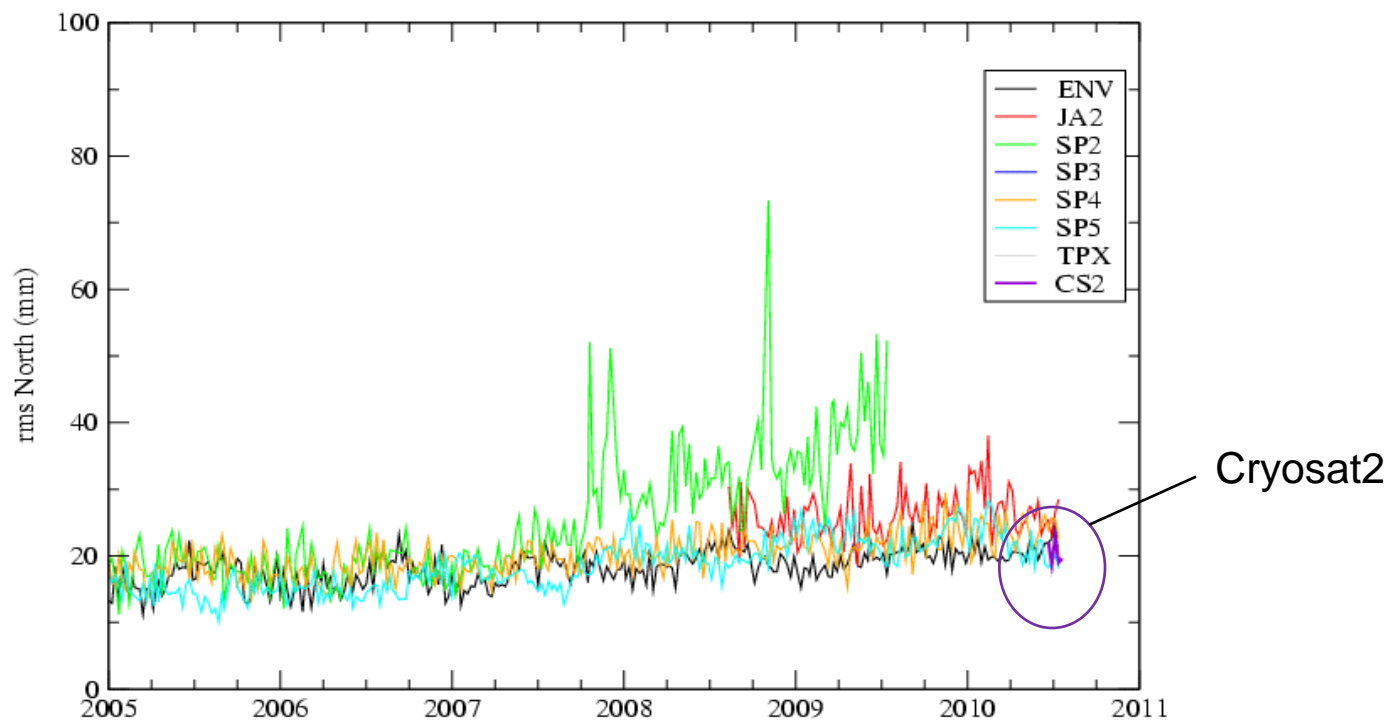
# All satellites



# All satellites & Combination including ja2

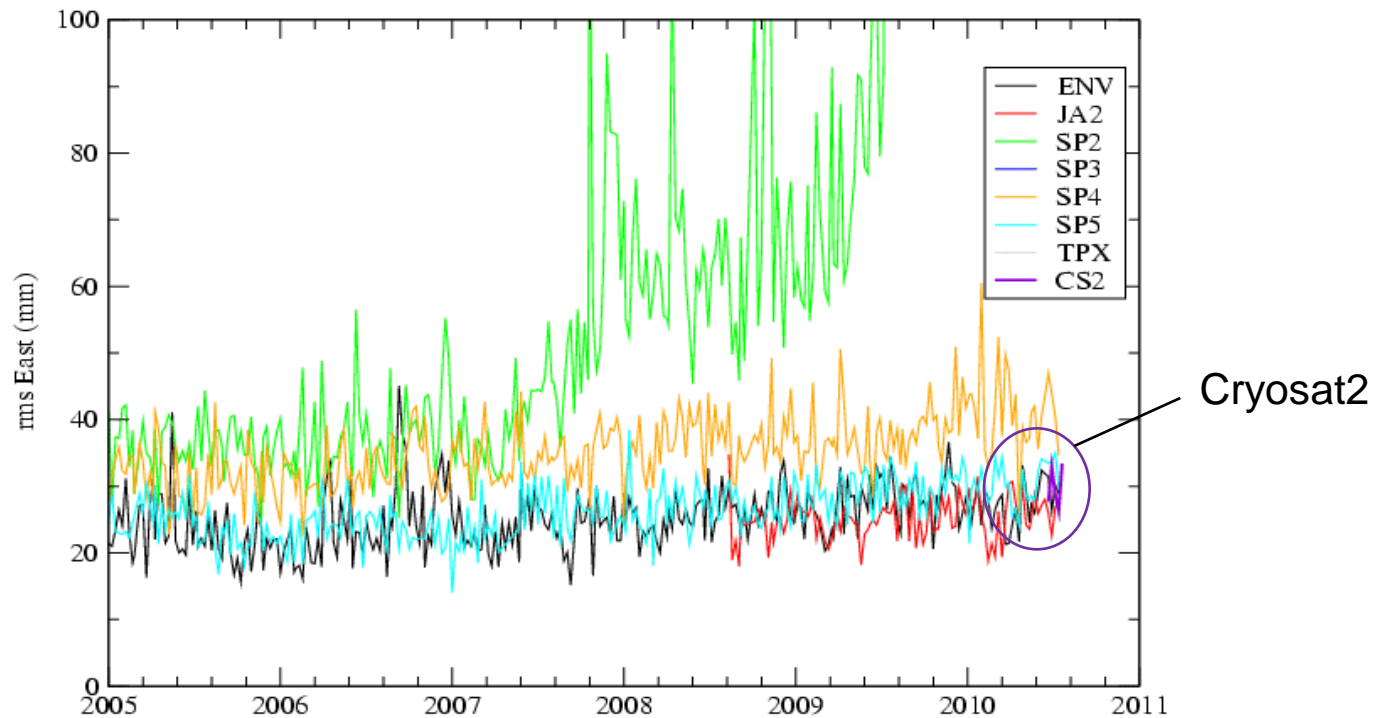


# Latitude

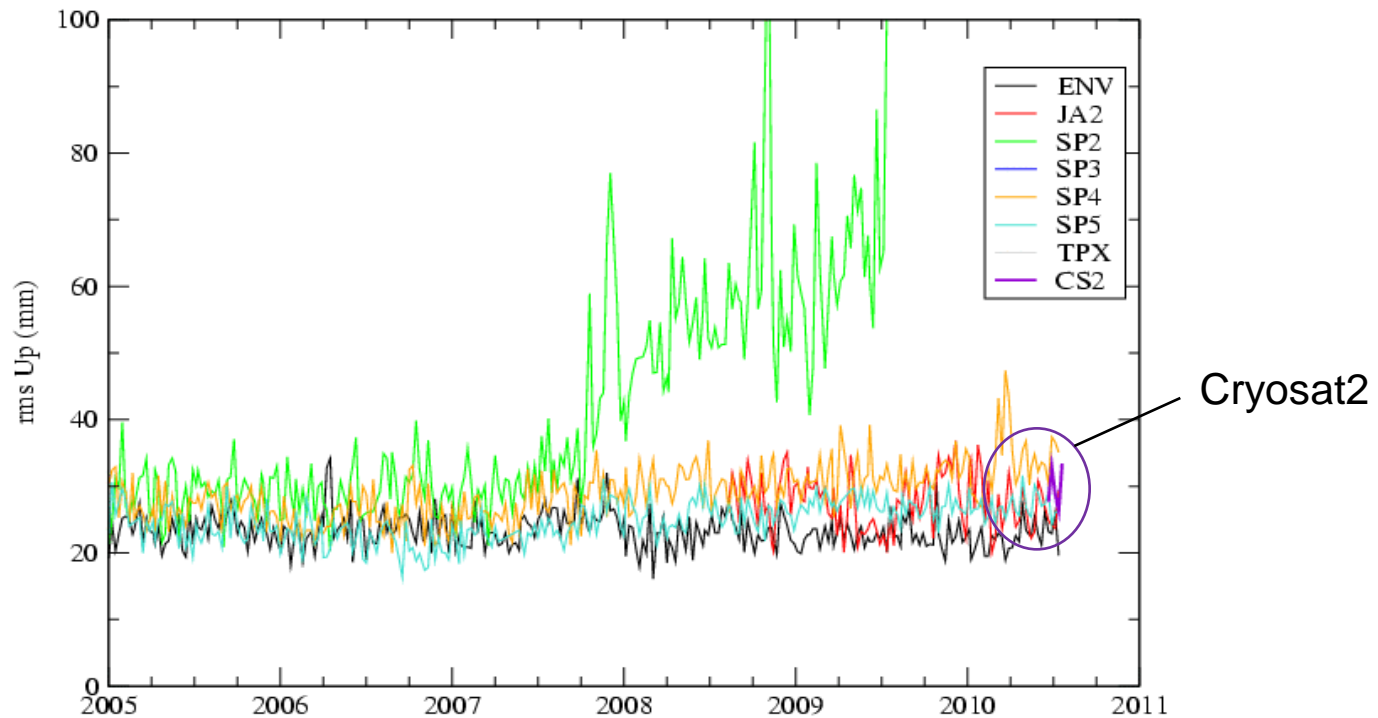




# Longitude



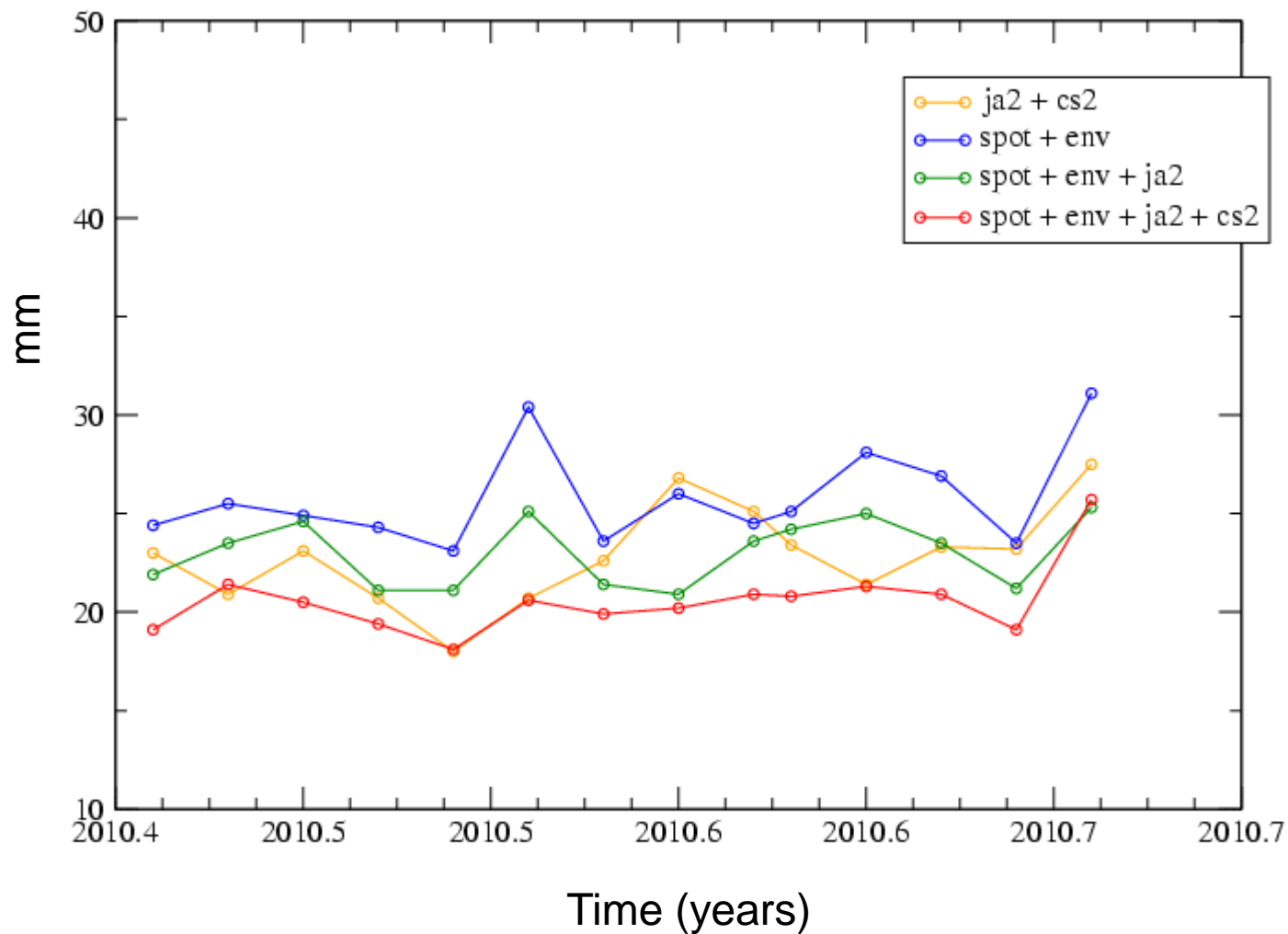
# Verticale



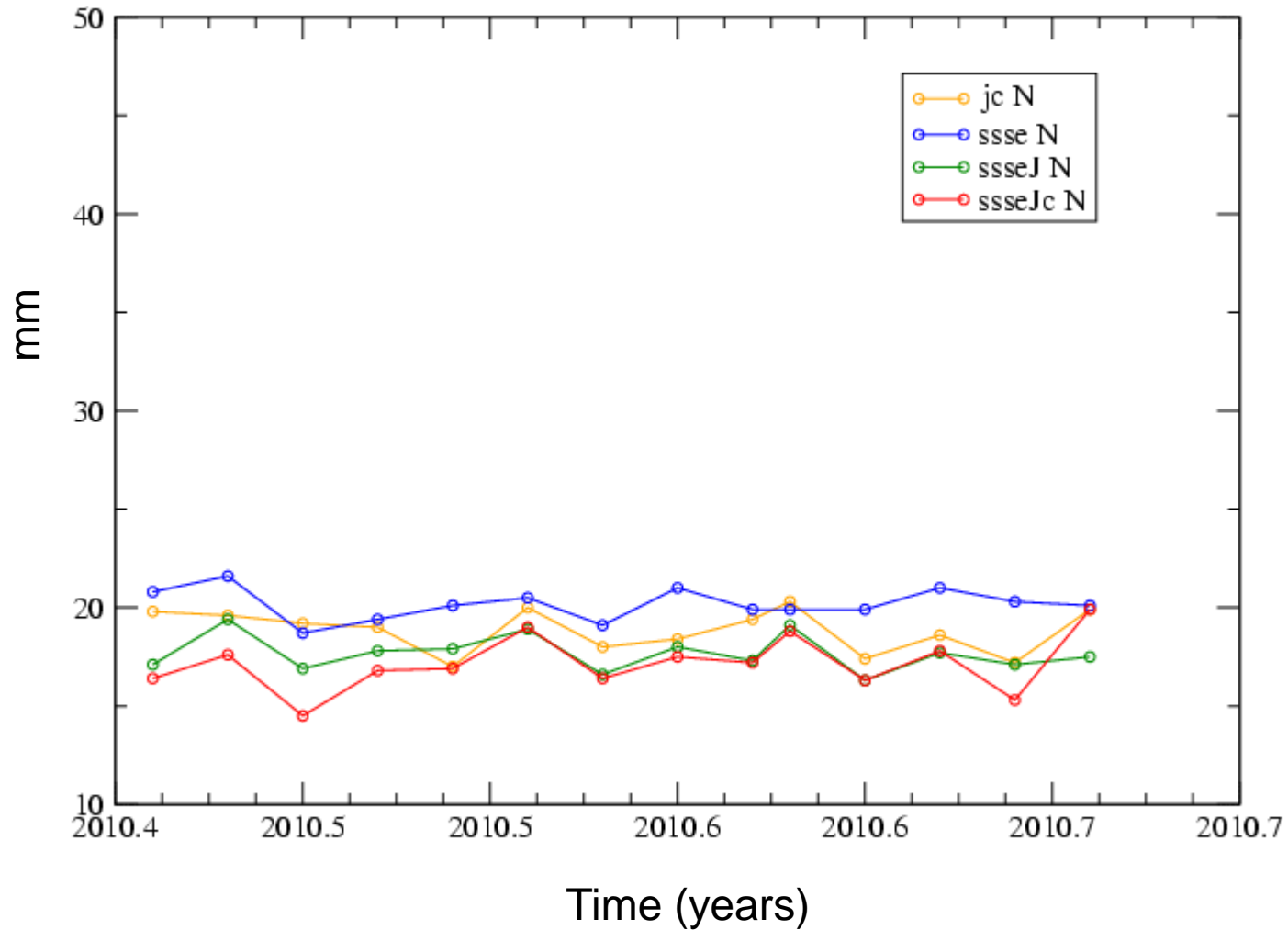
# **CONTRIBUTION OF CRYOSAT-2 TO THE COMBINATION (FIRST RESULTS)**

# Weekly 3D RMS

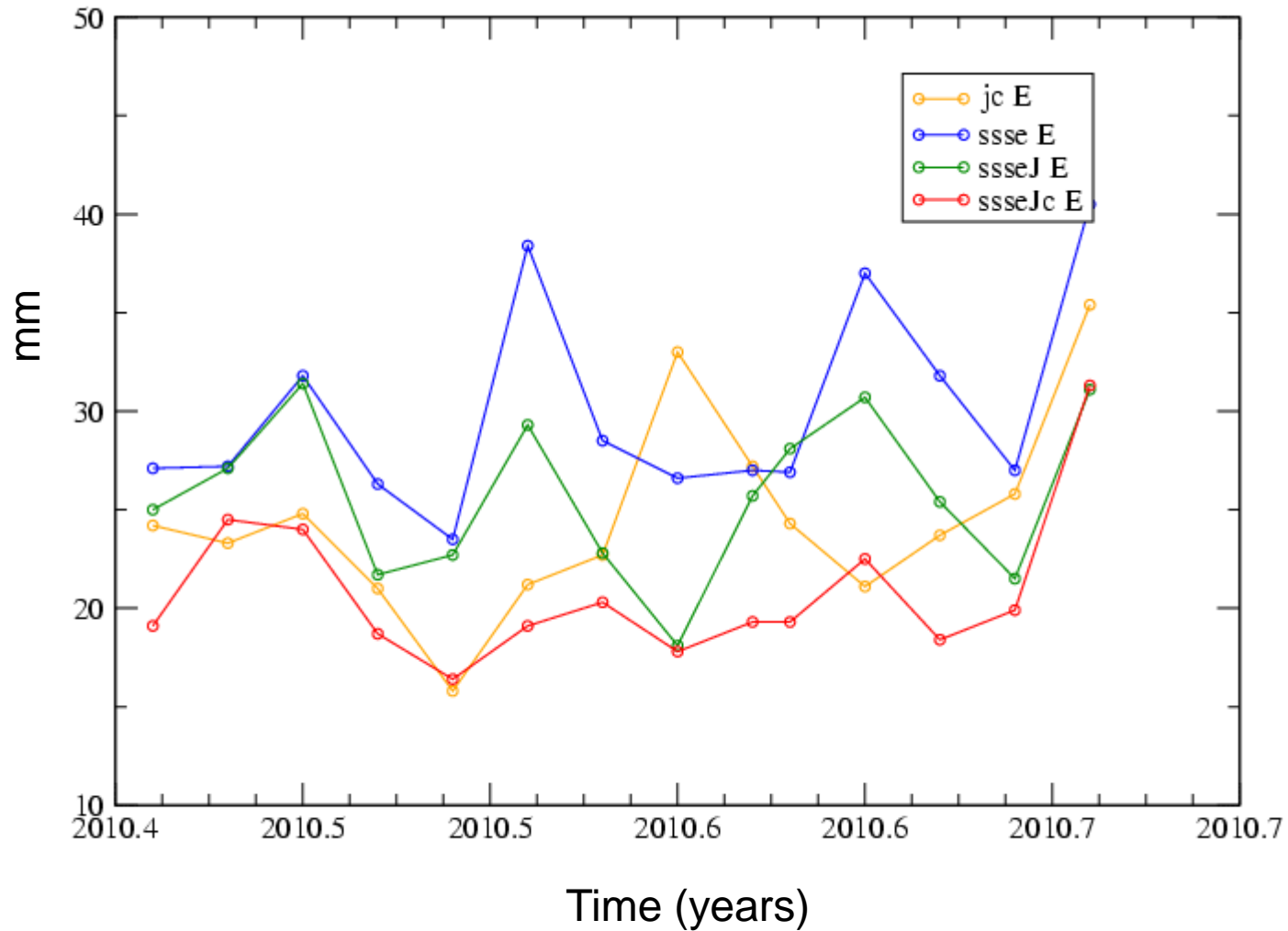
## Weekly DORIS solutions wrt DPOD2005



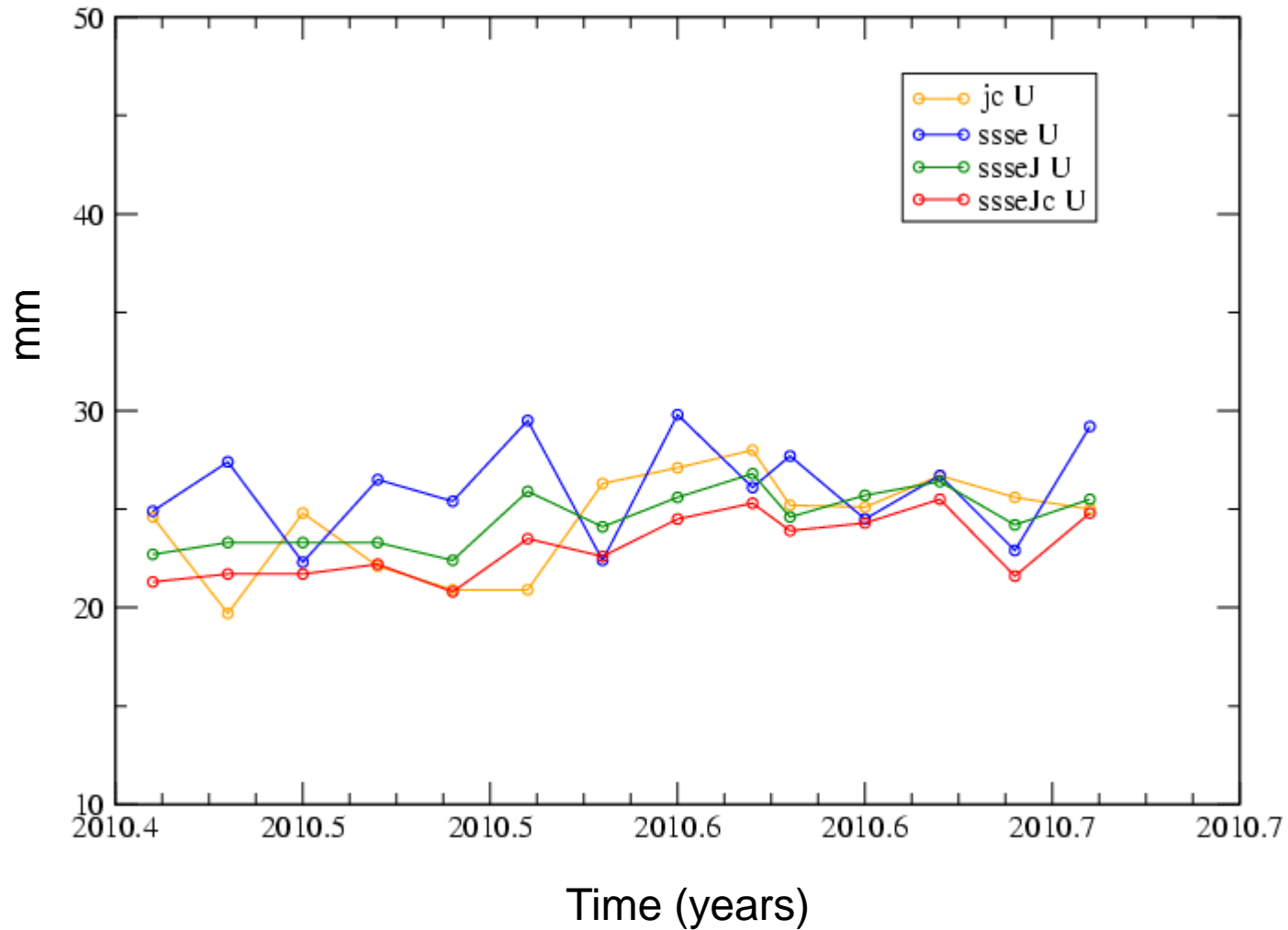
# Weekly North RMS



# Weekly East RMS



# Weekly Up RMS



# Contribution of ja2 and cs2 for station positioning

ja2 + cs2 vs spot+env

ja2+cs2: 2 orbital planes / 2 altitudes / DGXX

spot+env: 1 orbital plane / 1 altitude / 1G, 2G

ja2+cs2 better than spot+env

ja2+cs2 better than spot+env+ja2 for East component

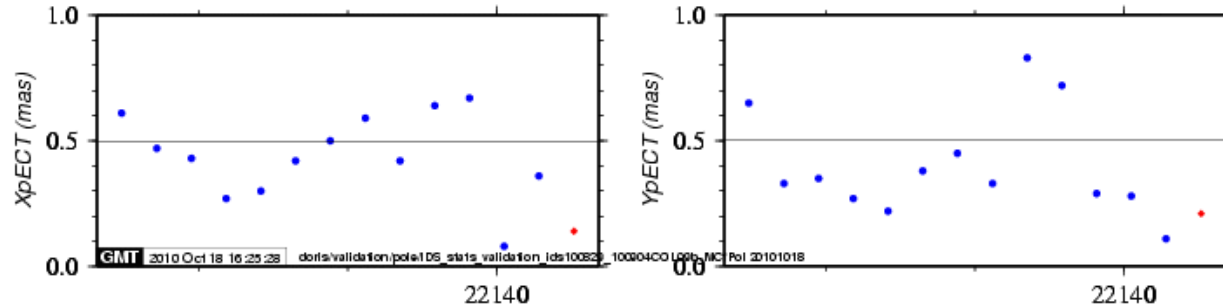
spot+env+ja2+cs2 vs spot+envisat

gain in north (3-5 mm), east (>5mm), vertical (5 mm)

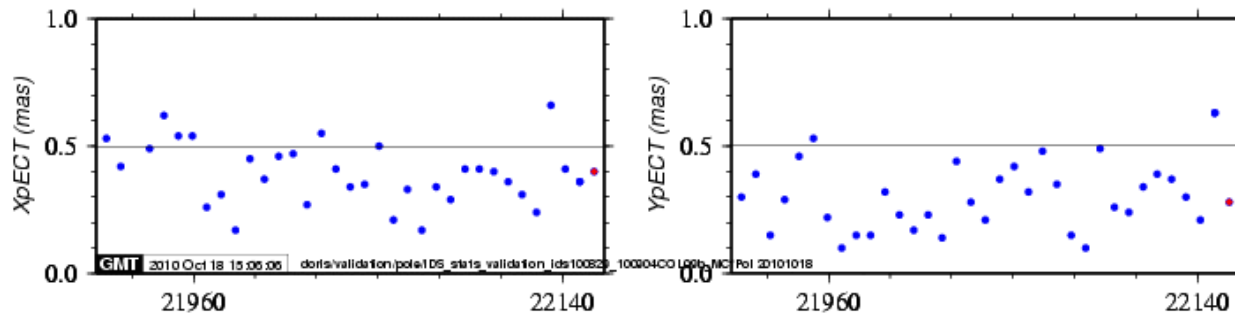


# EOP weekly Std Dev (wrt EOP05C04)

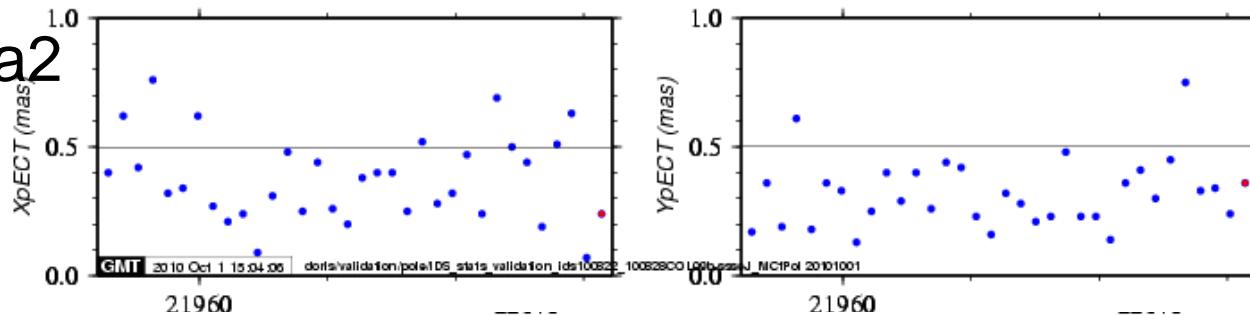
ja2+cs2



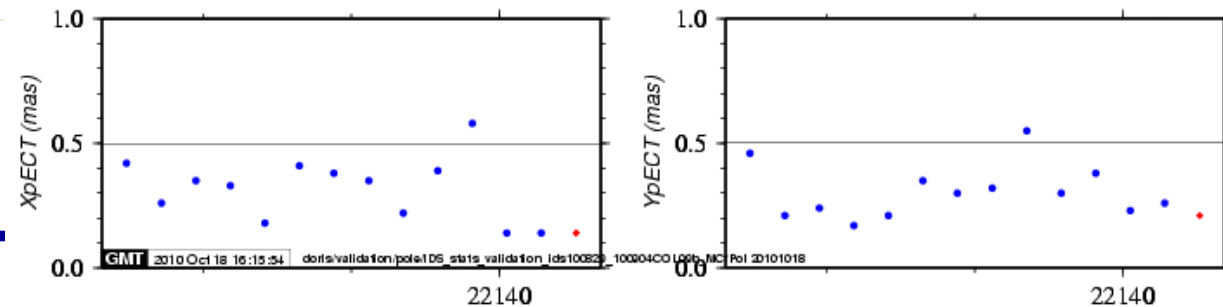
spots+env



spots+env+ja2



spots+env  
+ja2+cs2



Cryosat-2's contribution

2010 Lisbon, Portugal

**THANK YOU**