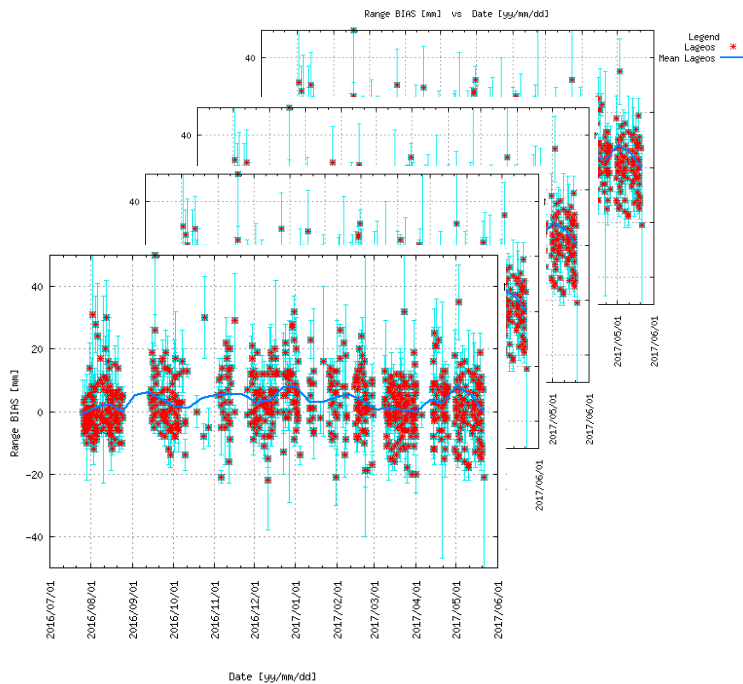


# The ILRS ASC Pilot Project on systematic error estimation



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# *ILRS Pilot Project on systematic errors*

- Weekly estimation of coordinates, EOP and range biases
- Time frame: 2005-2008
- Data: L1 and L2
- Time series with separate range biases
- New convention to report the site wavelength of the biases SINEX file
- Available time series from 5/8 ACs: ASI, BKG, DGFI, GFZ, JCET

# Internal ILRS convention

System	CDP ID#	SOLN Flag	Wavelength
Concepcion	7405	400	423
Concepcion	7405	800	846
Zimmerwald	7810	400	423
Zimmerwald	7810	500	532
Zimmerwald	7810	800	846
SOS Wettzell	7827	400	425
SOS Wettzell	7827	800	850
Matera	7941	300	355
Matera	7941	500	532

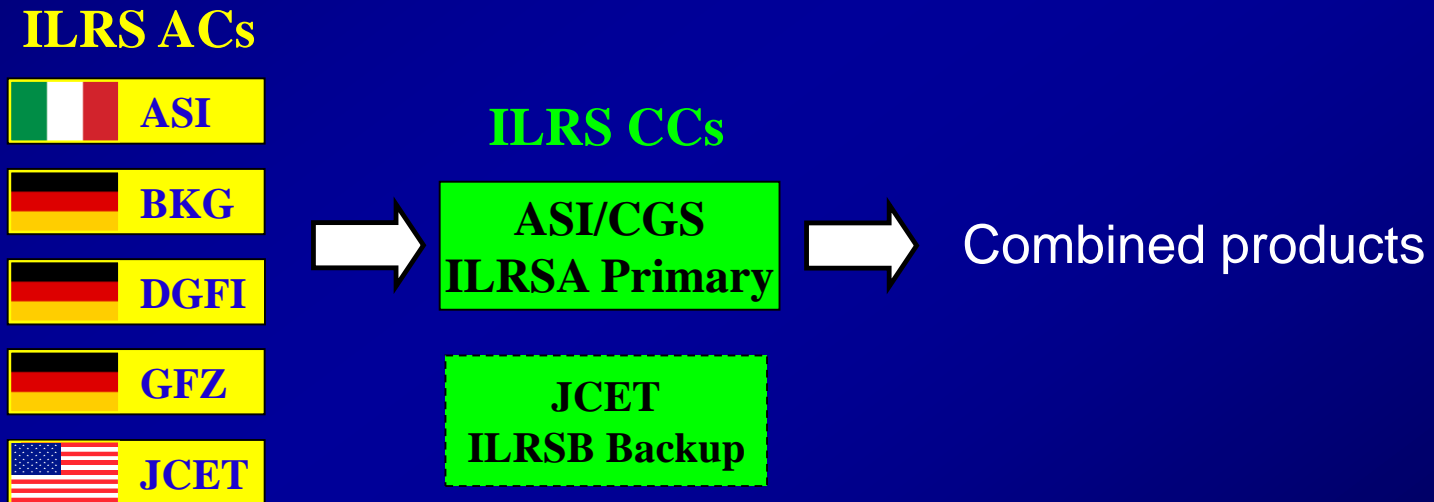
Use the hundreds of the wavelength instead of 1,2,3, etc.

+SOLUTION/ESTIMATE

*INDEX	TYPE	CODE	PT	SOLN	REF_EPOCH	UNIT	S	' ESTIMATED VALUE	STD_DEV
1	RBIAS	1864	L1	501	06:144:43200	m	2	-.483950051050630E-01	.552626E-01
2	RBIAS	1864	L2	501	06:144:43200	m	2	-.328793856394894E-01	.598145E-01
3	RBIAS	1884	L2	501	06:144:43200	m	2	0.550701015634650E-01	.120007E+00
4	RBIAS	7405	L1	801	06:144:43200	m	2	0.333156587892270E-02	.600274E-02
5	RBIAS	7405	L2	801	06:144:43200	m	2	0.695240939794482E-02	.671321E-02

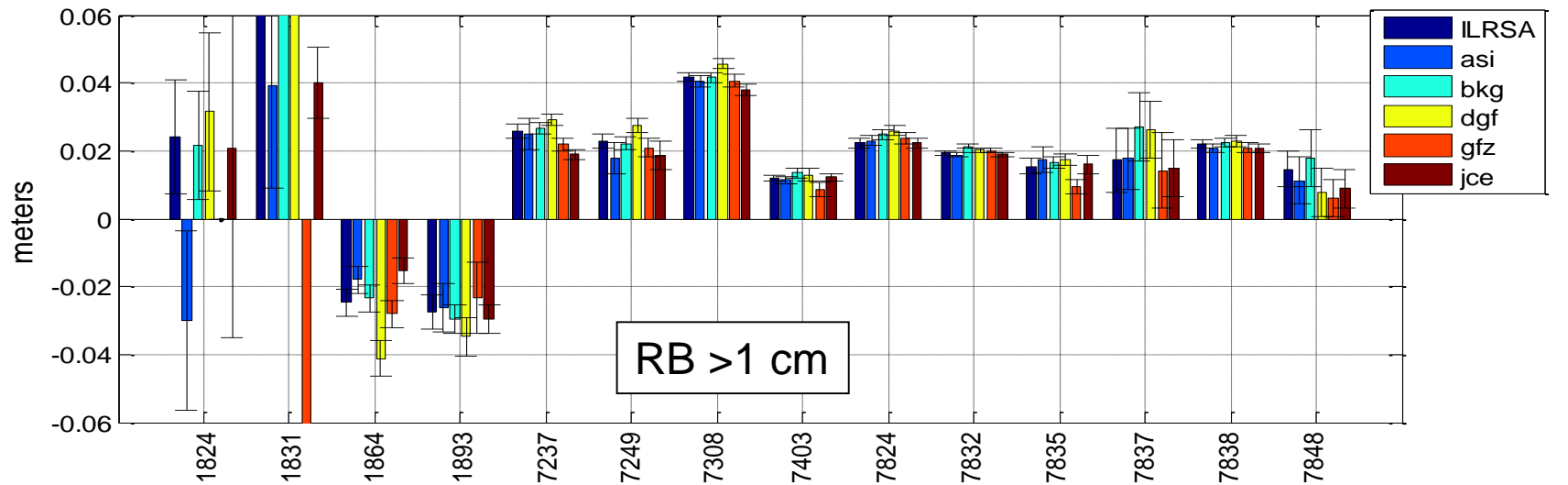
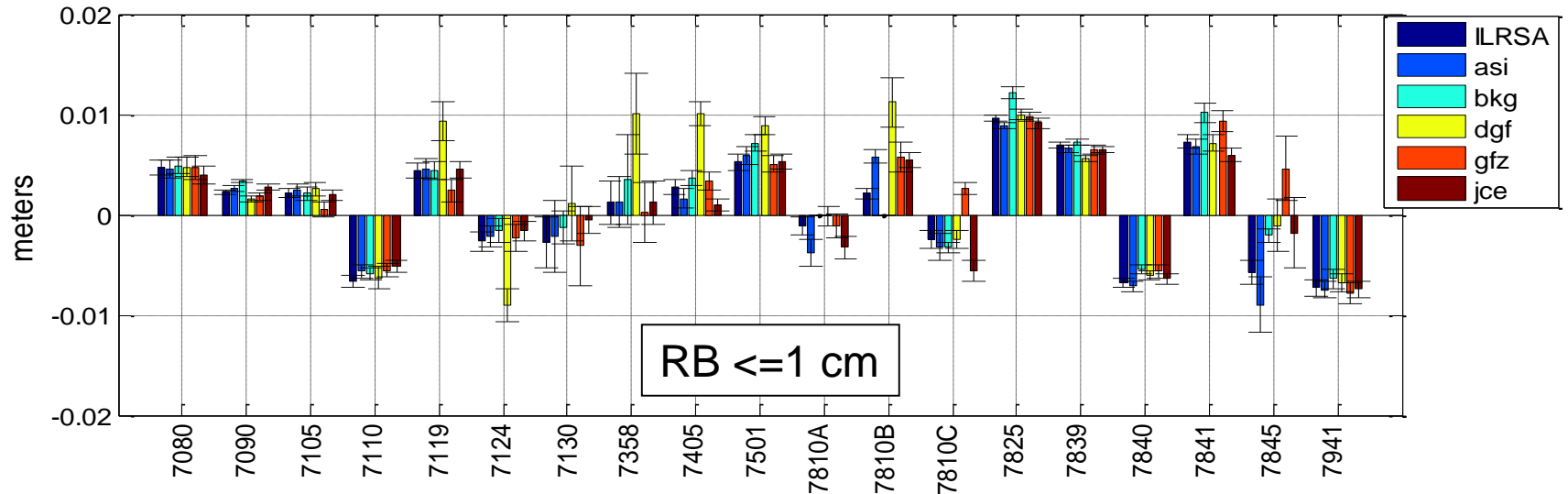
# *ILRS product combination*

The combined biases are produced following the standard process of the routine ILRS products (station coordinates, daily EOP, orbits) and adding the range bias estimation. The solutions are produced following the ILRS/ASC guidelines.



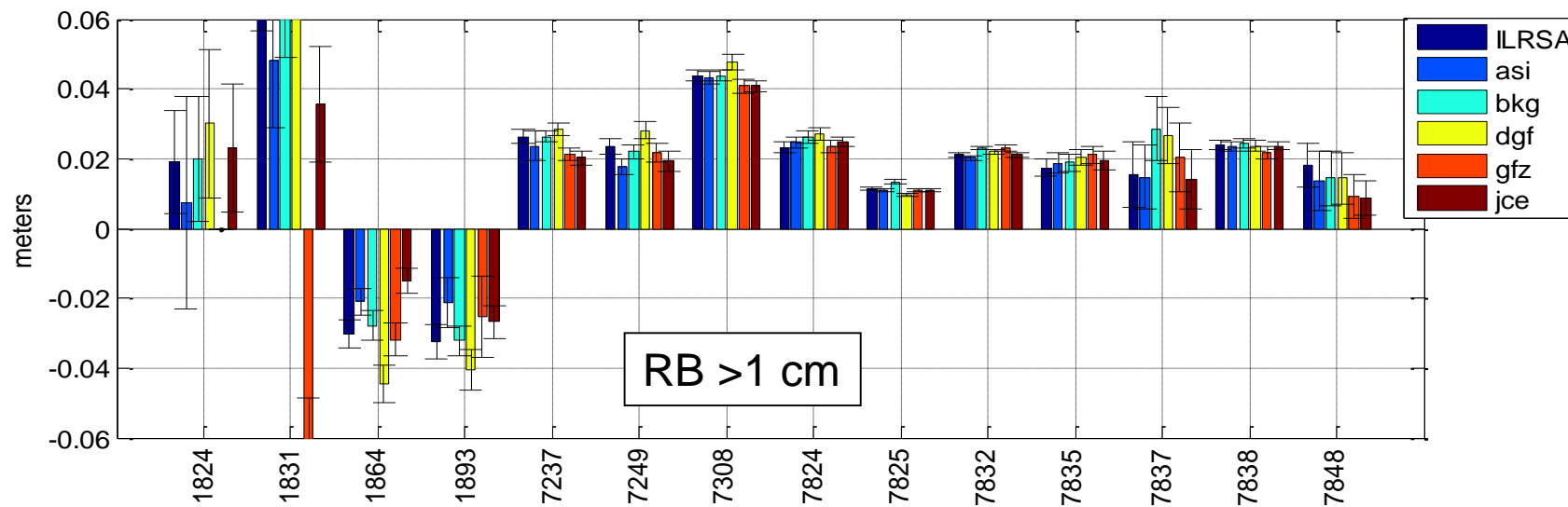
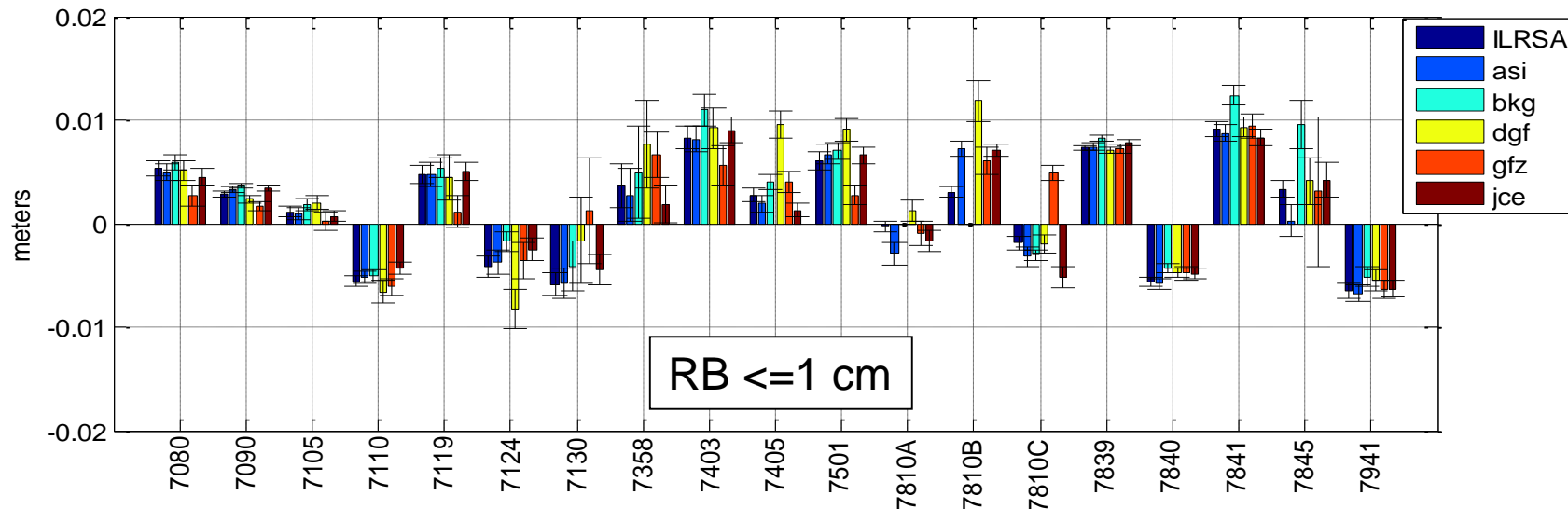
# LAGEOS-1 Range Biases

The Y-axis limits are different!

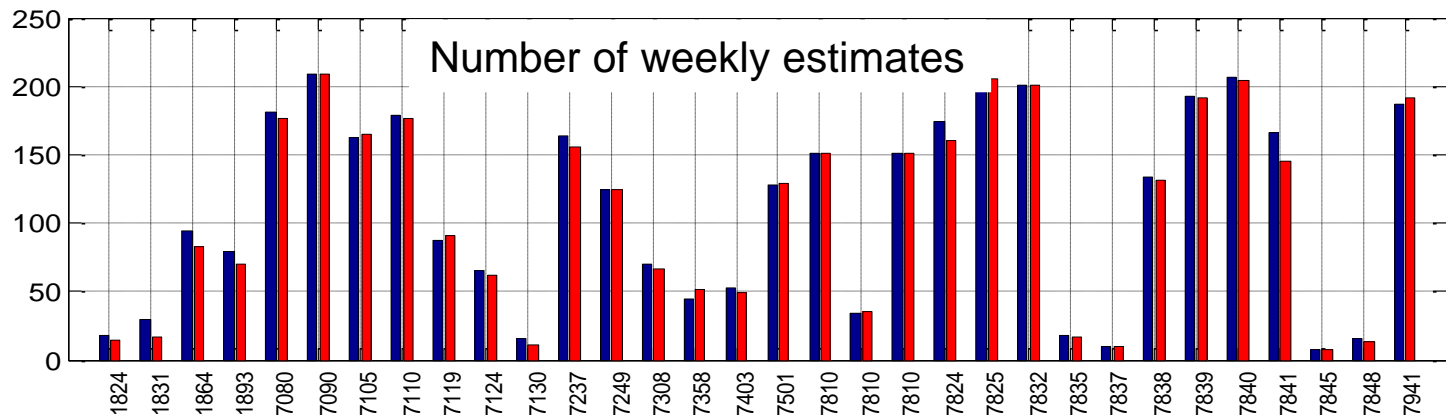
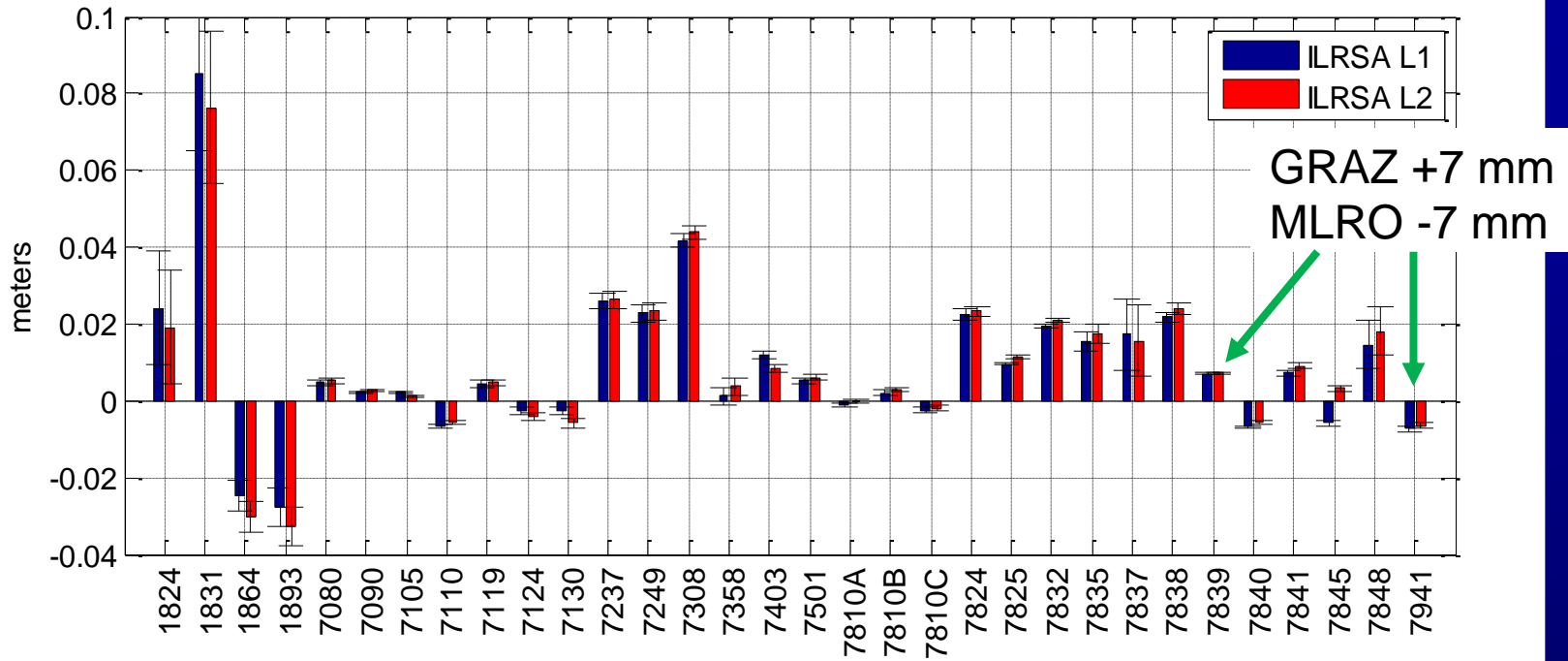


# LAGEOS-2 Range Biases

The Y-axis limits are different!

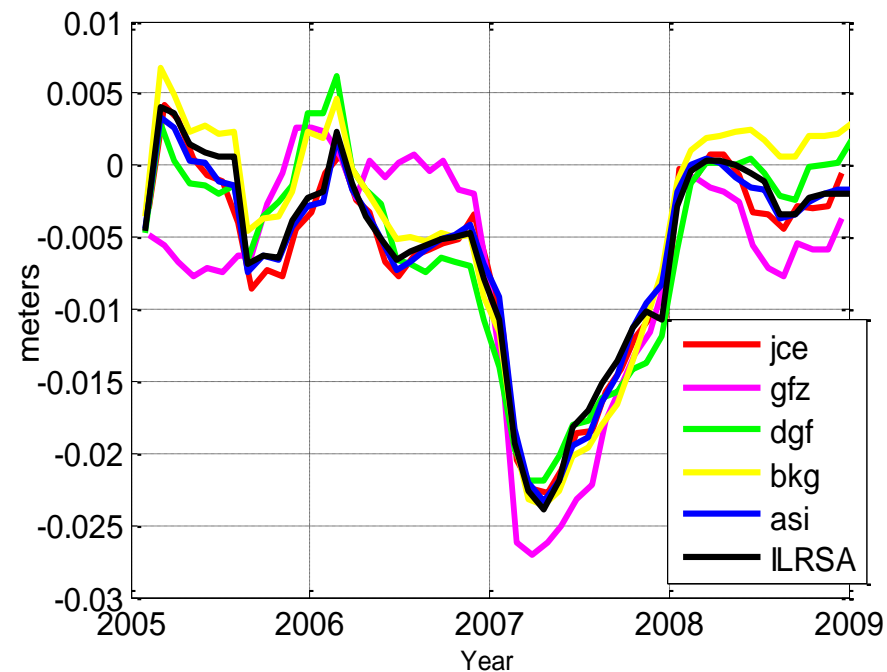


# Combined ILRSA Range Biases

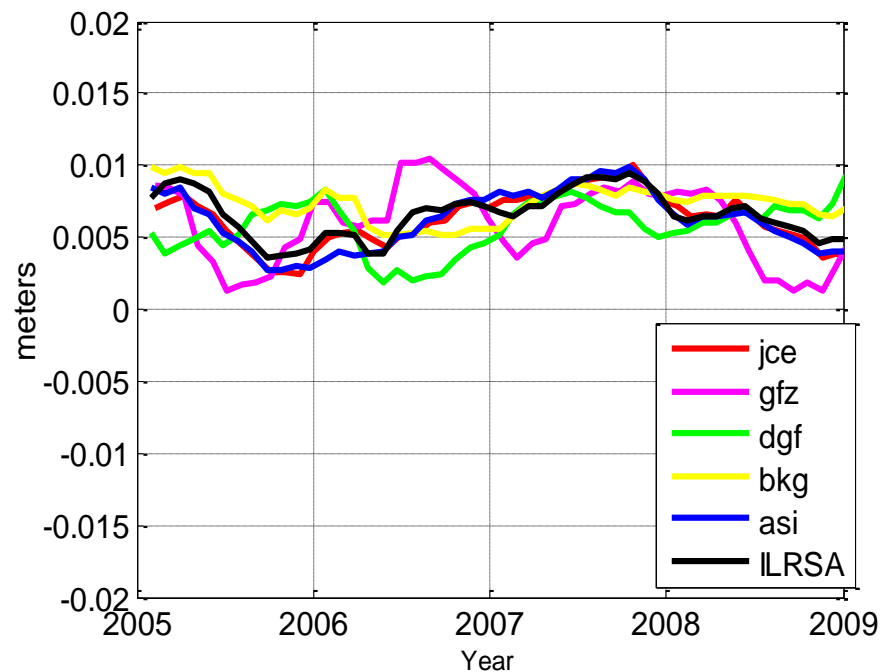


# Combined range biases

## MLRO LAGEOS1



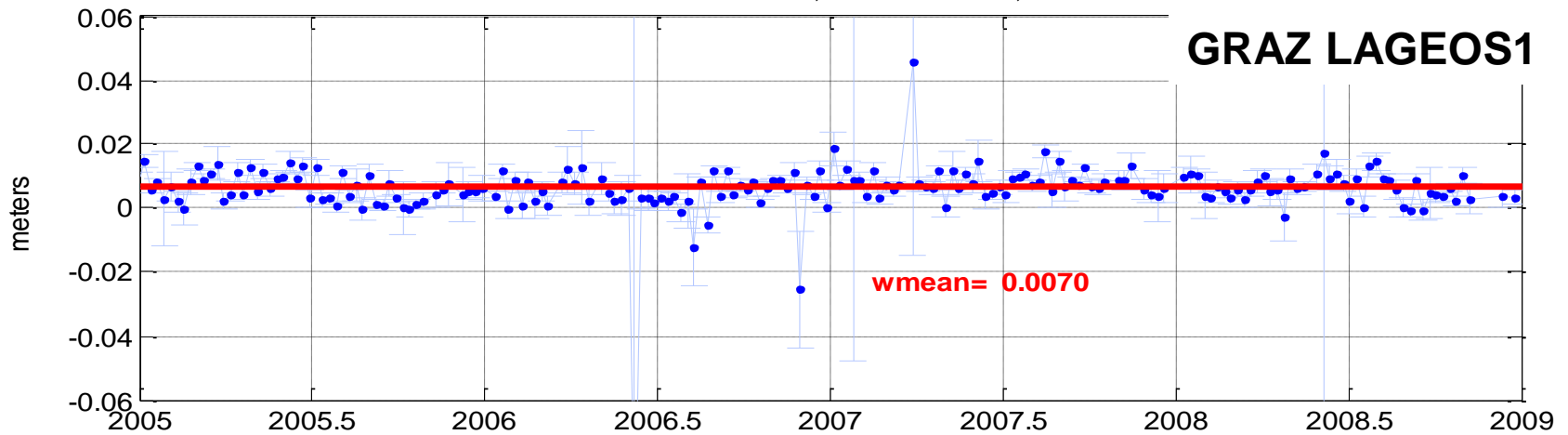
## GRAZ LAGEOS1



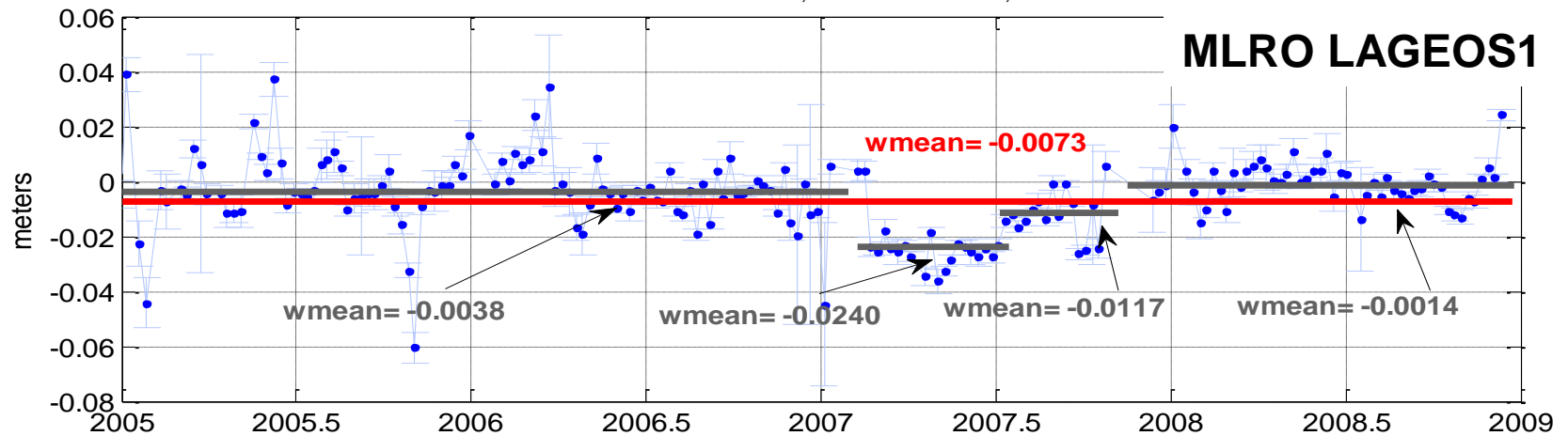


# Combined range biases

Station: 7839501; Satellite: 7603901;

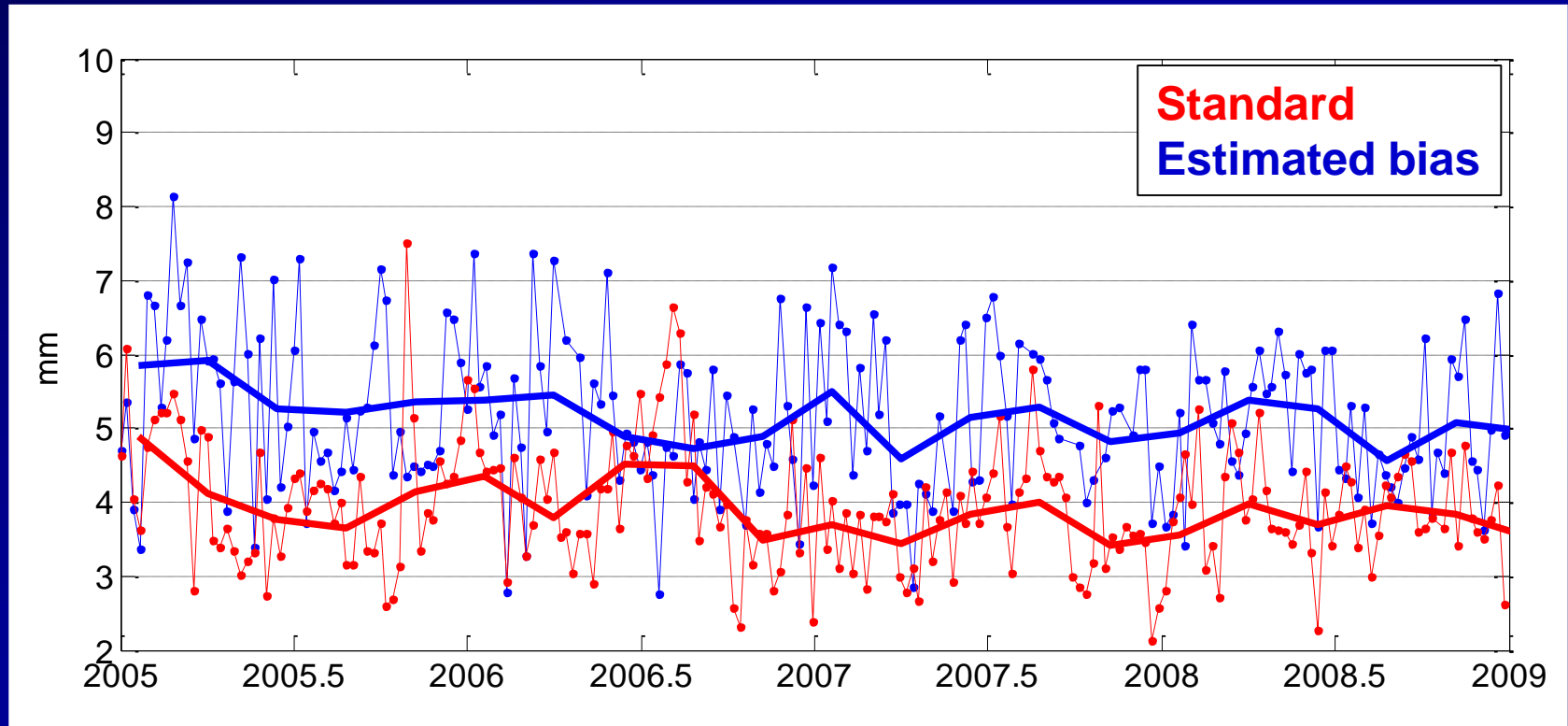


Station: 7941501; Satellite: 7603901;



# *Impact on the site coordinates*

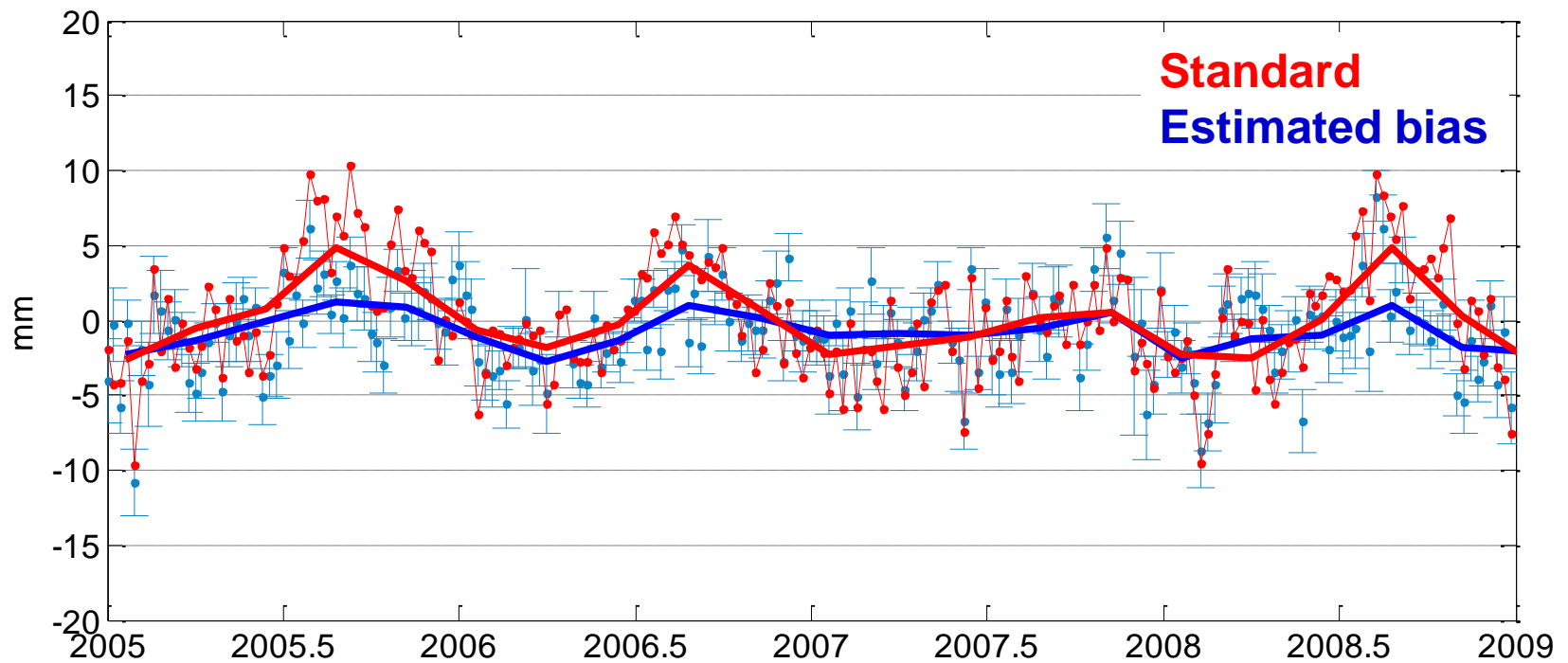
## 3D coordinate residual WRMS



Estimating the biases for all the sites together with the coordinates /EOP weakens the official IERS products

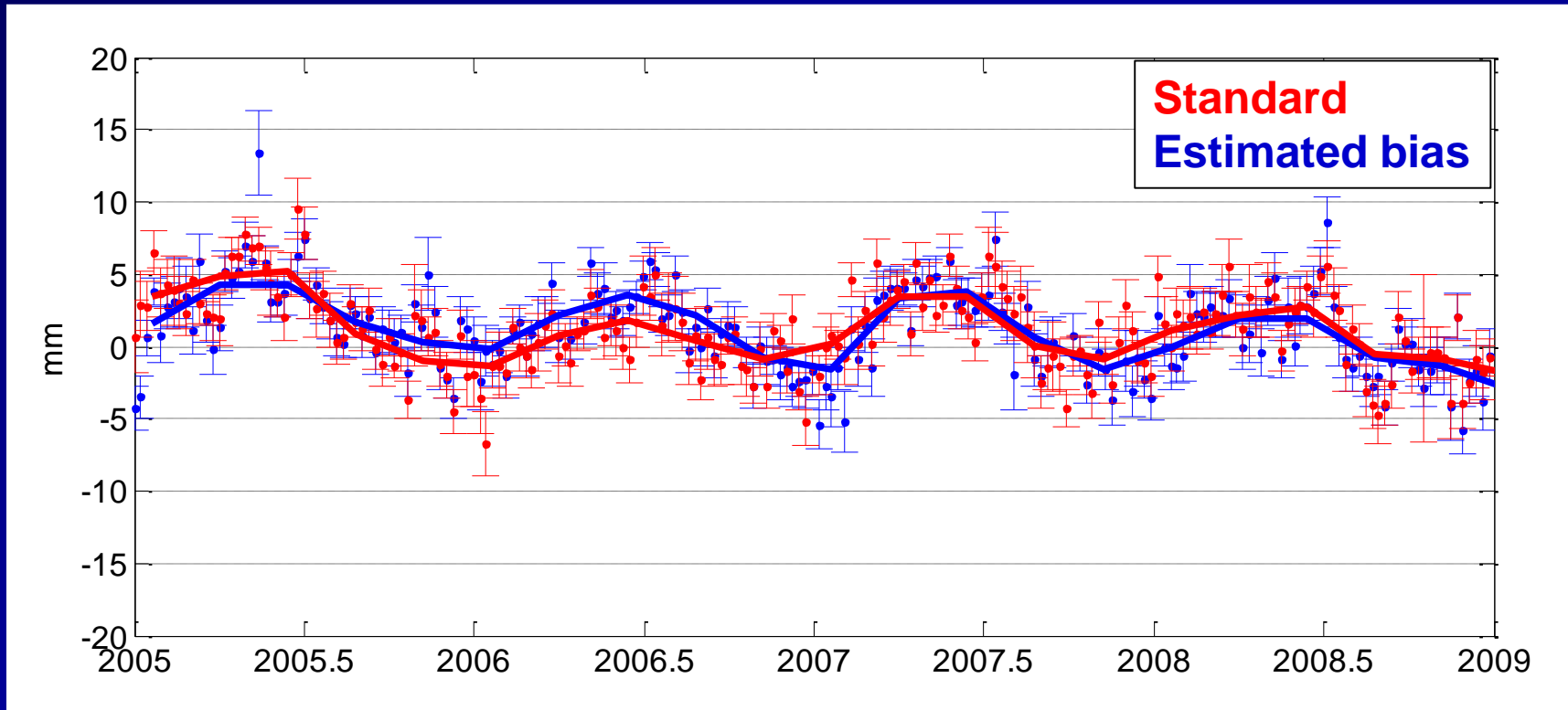
# *Impact on RF origin*

TX w.r.t. SLRF2014



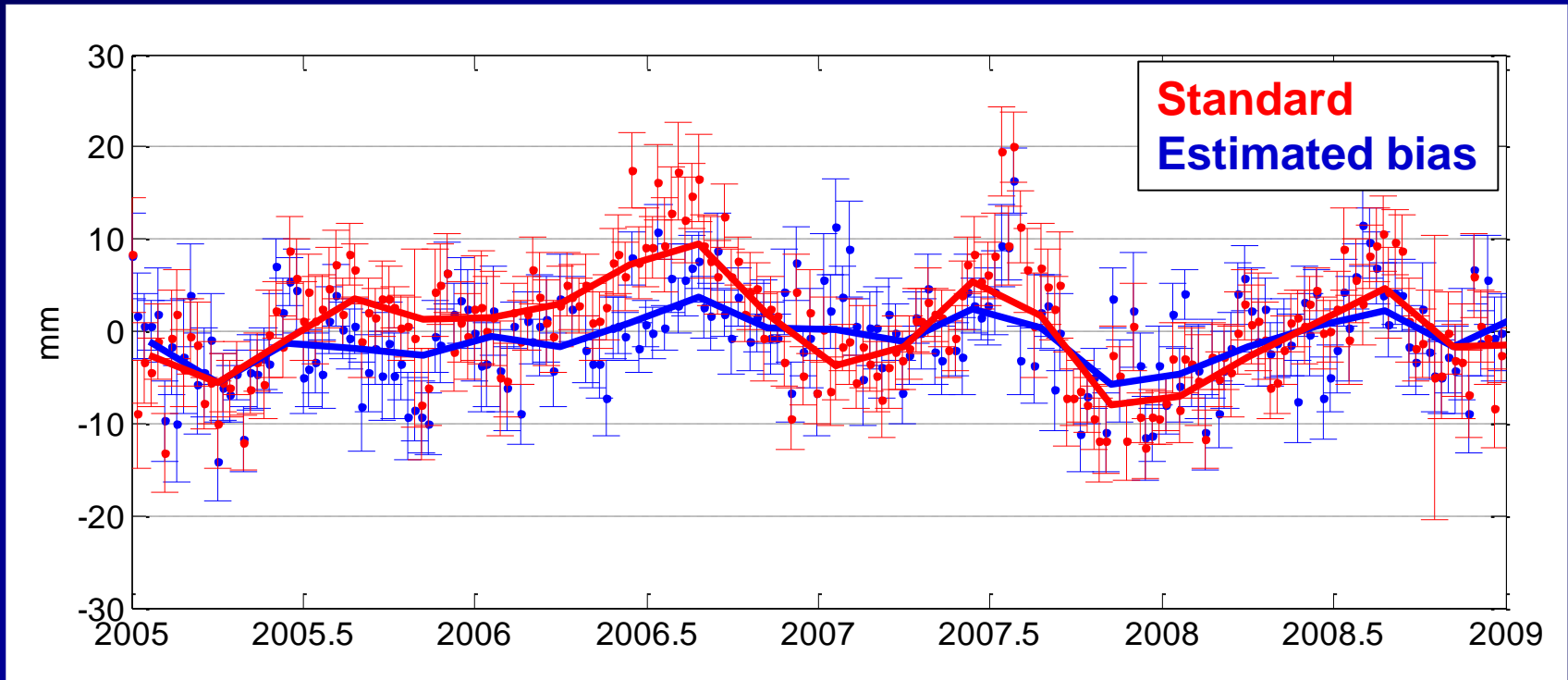
# *Impact on RF origin*

TY w.r.t. SLRF2014



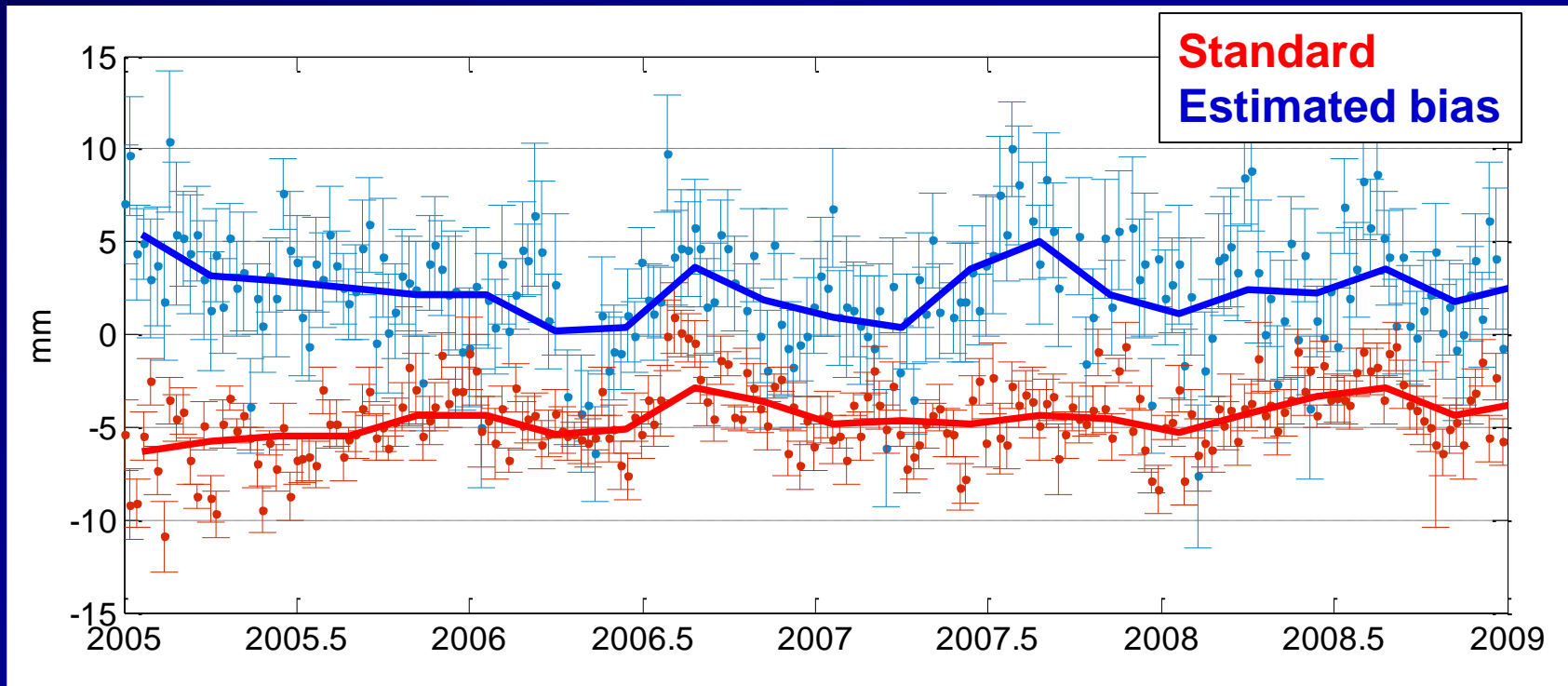
# *Impact on RF origin*

TZ w.r.t. SLRF2008



# *Impact on the scale*

Scale w.r.t. SLRF2014



The impact on the scale is motivating the ASC to move from the Pilot Project to an operational phase

# *Future of the PP*

## **Next activities:**

- compute the weekly time series since 1983 (both Acs and CCs)
- make a table of biases using the time series of combined range biases from 1983 up to now
- apply the bias values in the table for the official ILRS products
- report the applied RB (& TB) in the SINEX file for next contribution to ITRF as recommended by the IAU
- start the service to keep the table updated

## **Timeline:**

- AC will submit their time series by the end on 2017
- The RB table will be ready by the end of February 2018
- The operational service is expected to come online by April. 2018