GSC Analysis Center Update

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Delft, The Netherlands

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SINEX Delivery Update

- 156 weekly files : 2013 to 2015
- wd26 = Jason2, Cryosat2, SPOT5, HY2A
- wd27 = + SARAL
- 13 New DORIS stations beginning Sept. 1, 2013

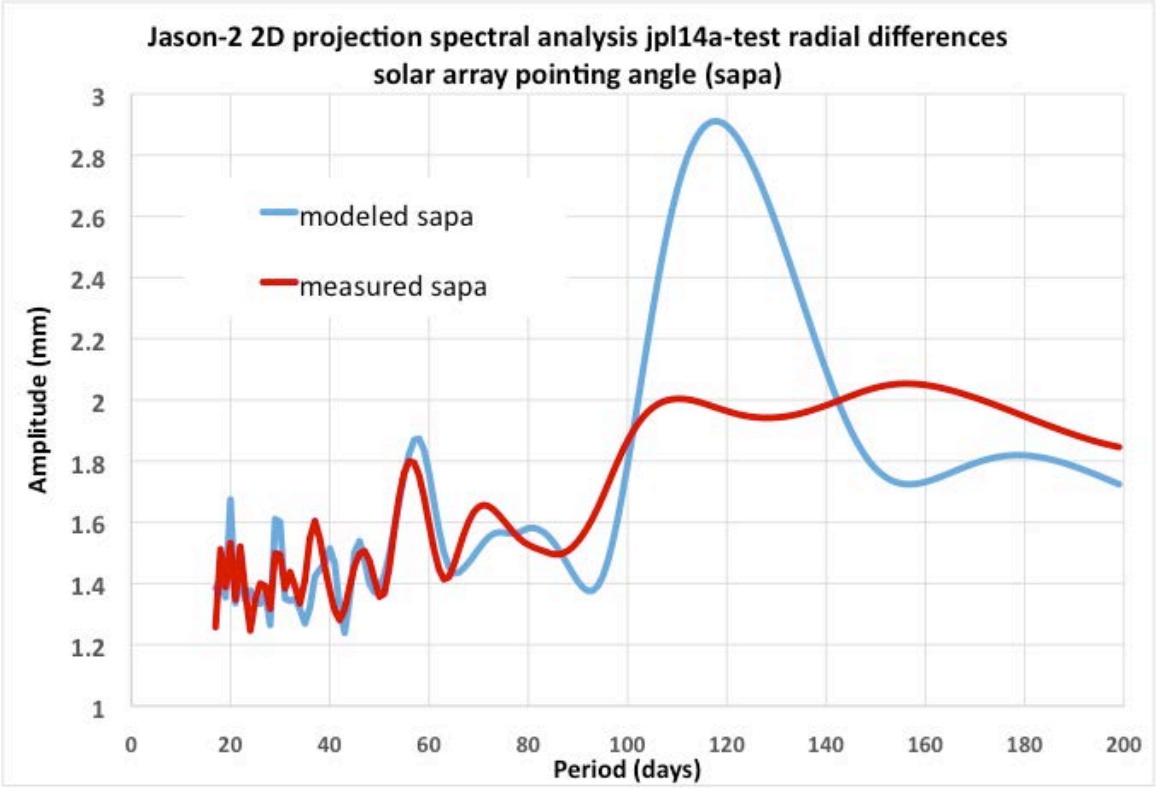
  ADHC GONC GR4B KEUC LAOB MAUB OWEC PDNC ROWC SOEB STKB SYQB TRJB

➔ (switch from DPOD2008v13 to DPOD2008v15)

- 1st Q 2016 wd27 weekly files delivery in June.

Tests with Solar Array Quaternions (J2)

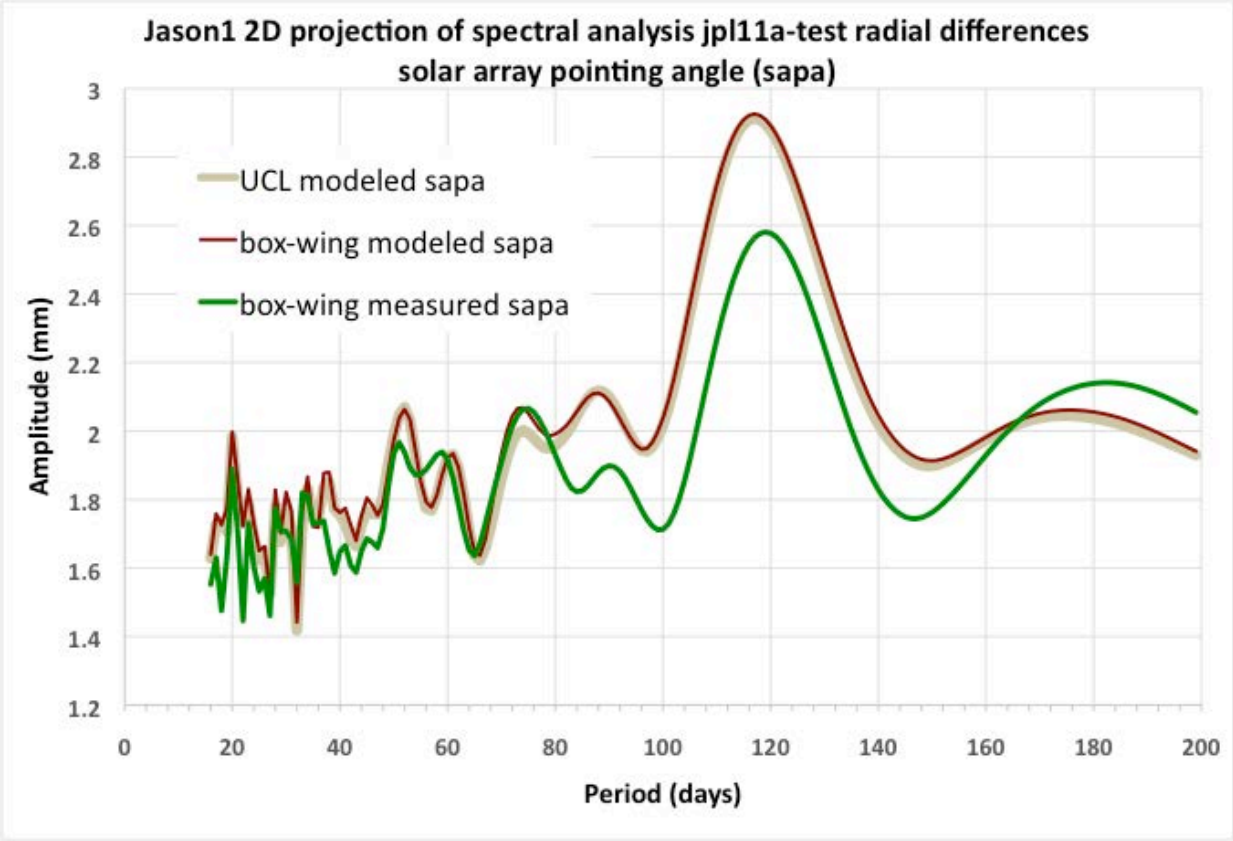
JA2- Solar Array quaternions Improve Force Model; Diminish differences between SLR/DORIS dynamic and JPL/GPS Red-dynamic orbits.



Presented at the OSTST, Reston, October 2015

Tests with Solar Array Quaternions (J1)

JA1- Solar Array quaternions also Improve Force Model, but improvements are not as large



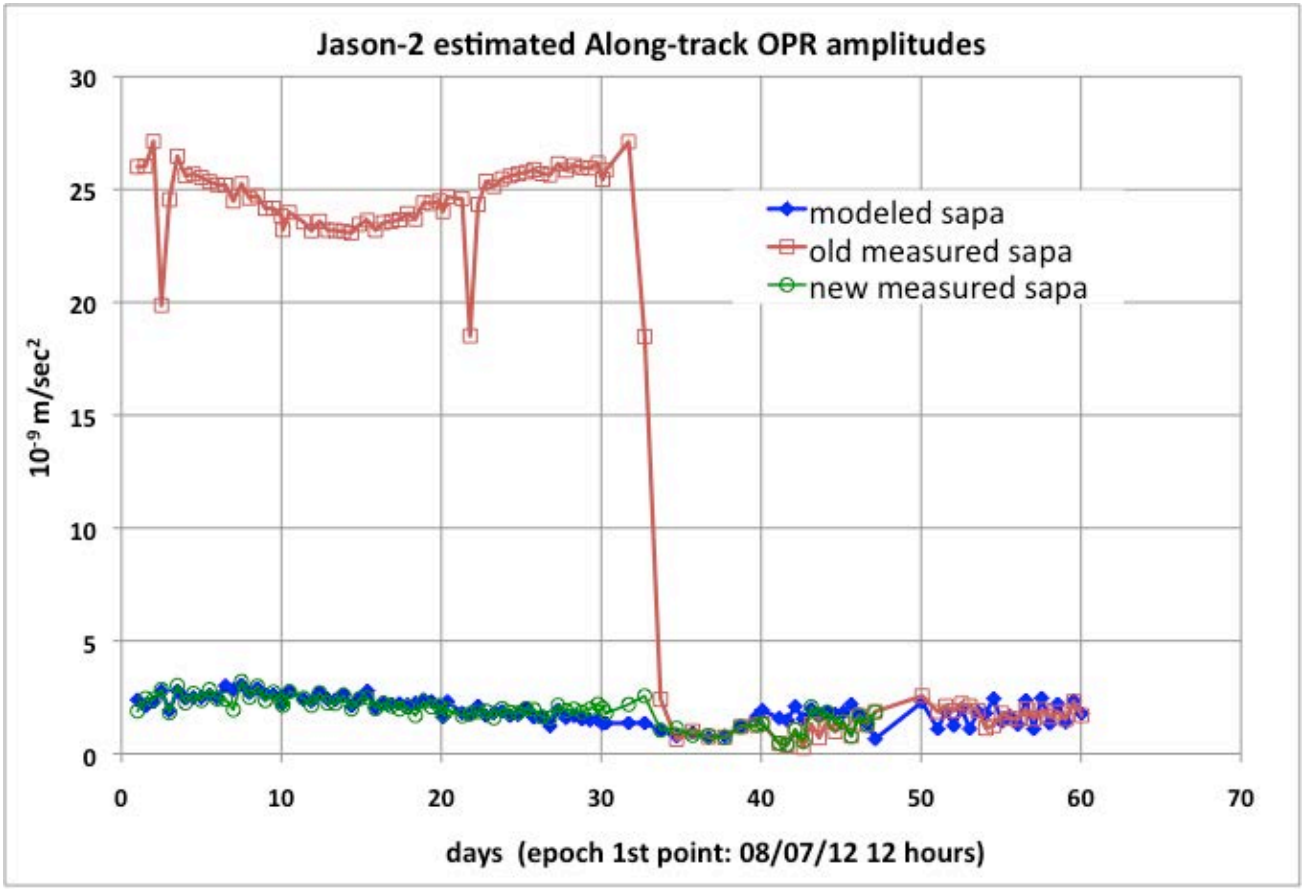
Presented at the OSTST, Reston, October 2015

Tests with Solar Array Quaternions (J1, J2)

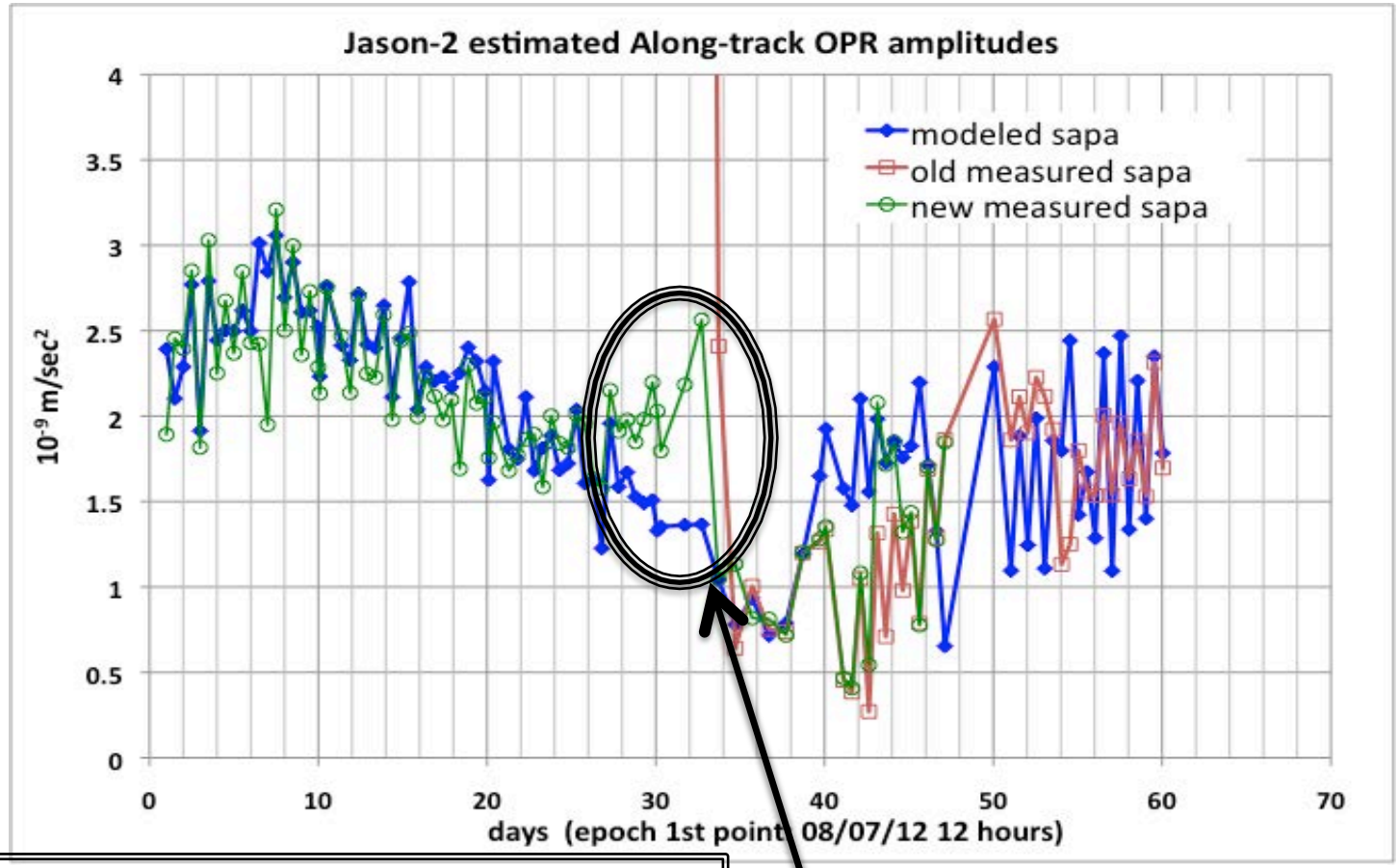
Satellite	Model	SAPA	Along-track Daily Avg. (nm/s²)	Cross-track Daily Avg. (nm/s²)
Jason-1	UCL	no	**1.52**	**1.71**
	Macromodel	no	2.15	2.10
	Macromodel	yes	1.71	2.32
Jason-2	Macromodel	no	1.24	2.44
	Macromodel	yes	**1.12**	2.55

Jason-2 Excluding cycles 1-4.
wrt. to empirical accelerations, Along-track is improved with use of solar array quaternions (SAPA); Cross-track degrades. For Jason-1, UCL model still has lowest empirical accelerations, even if the nominal solar array attitude is used.

Problem detected, J2 SA quaternions cycles 1-4



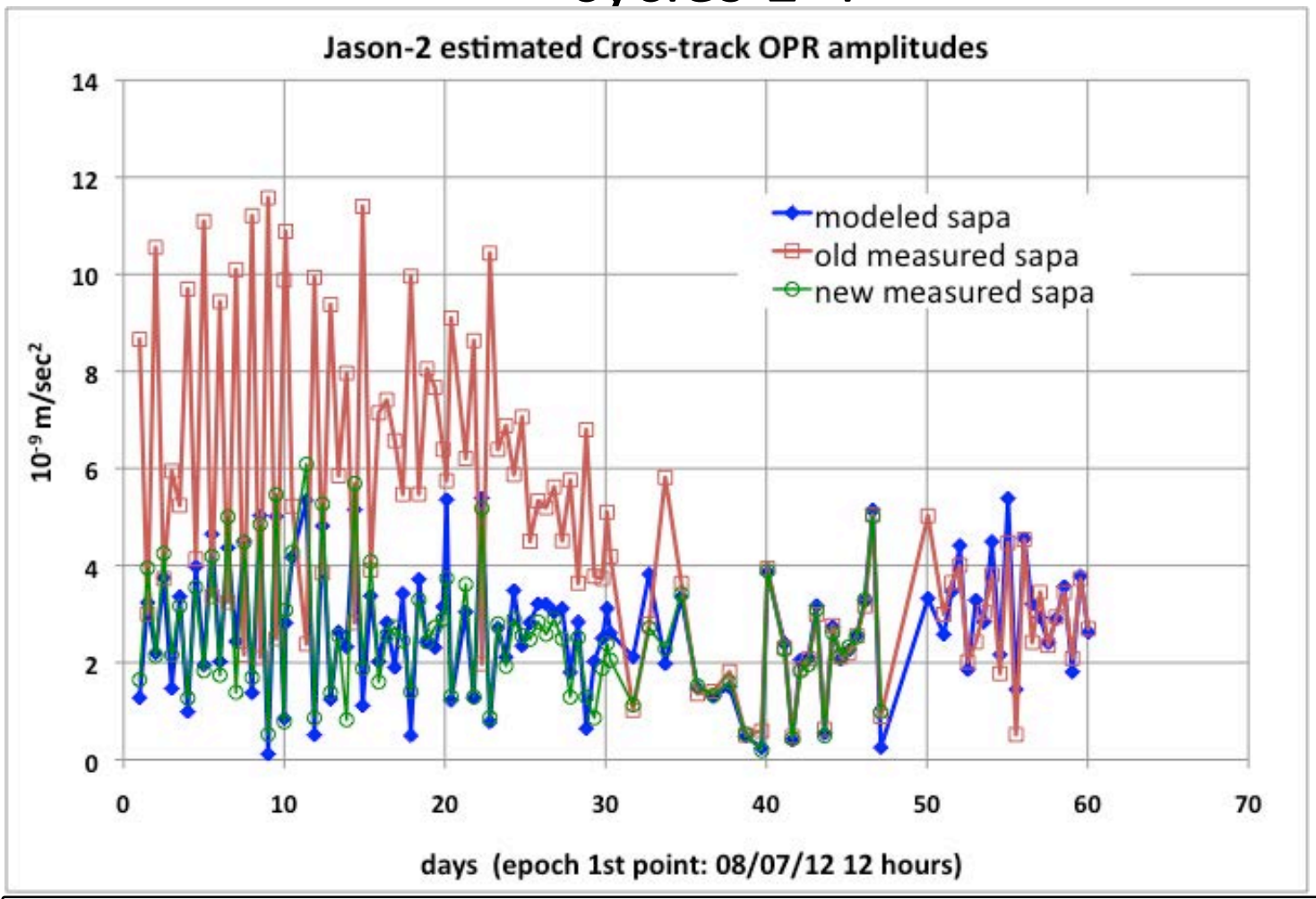
Problem detected, J2 SA quaternions cycles 1-4 (*zoom*)



Replacement quaternions show improvement; residual problem for cycle 4?

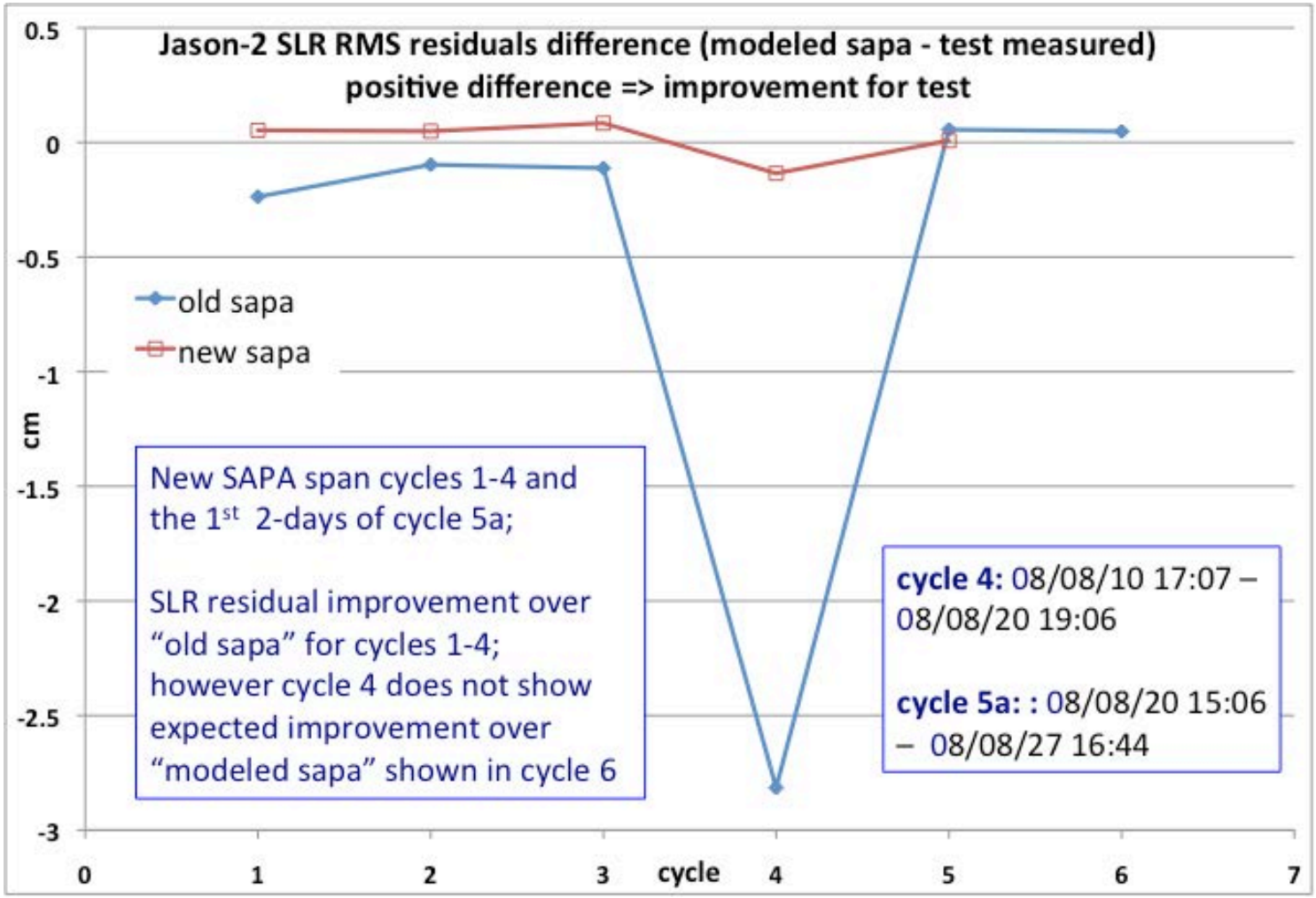
Possible problem remains for ~7 days?

Problem detected, J2 SA quaternions cycles 1-4



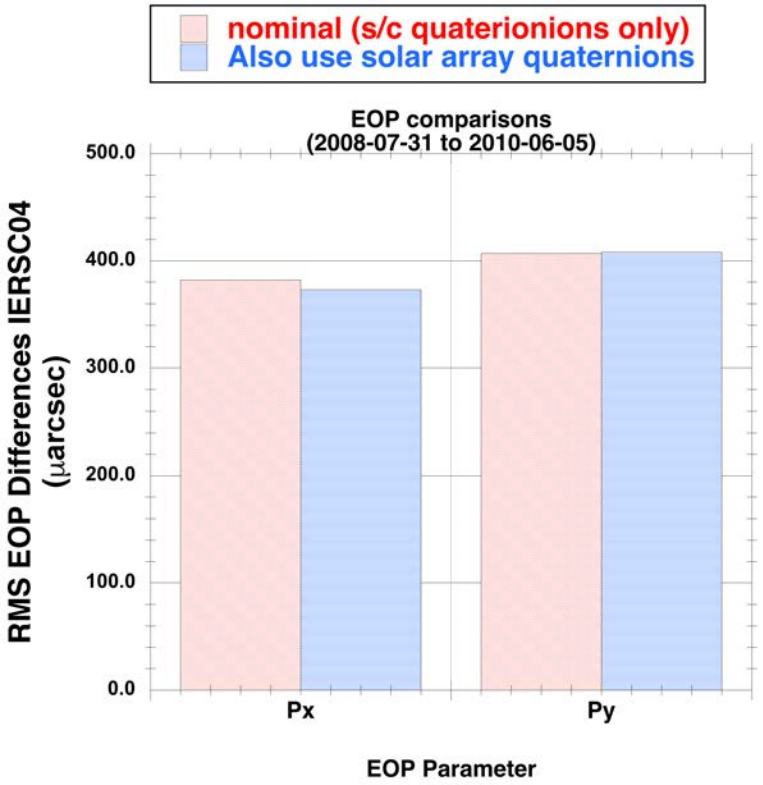
Replacement quaternions show improvement; For cross-track, - improvement in quaternions is confirmed.

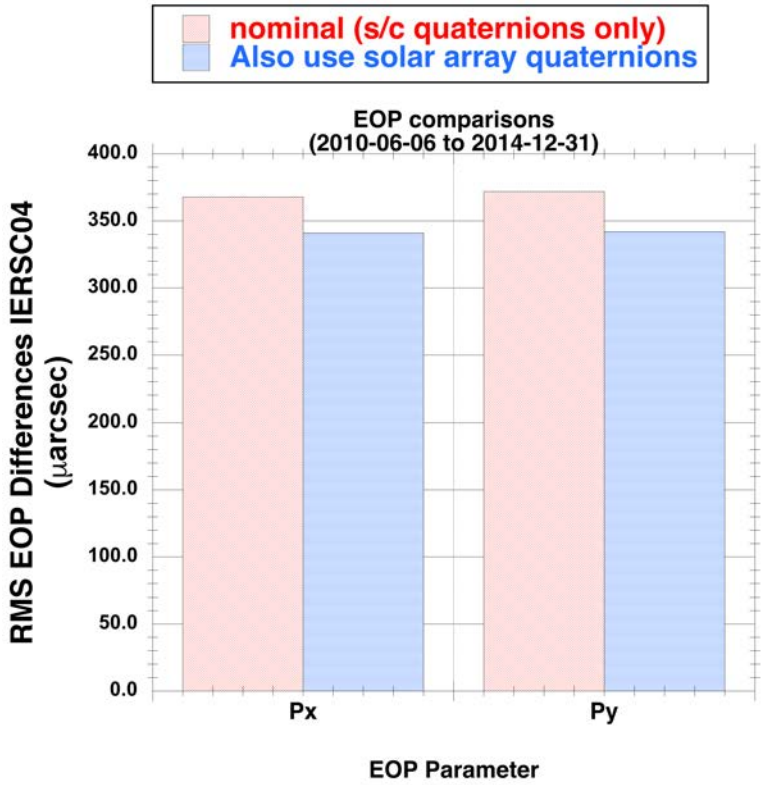
Problem detected, J2 SA quaternions



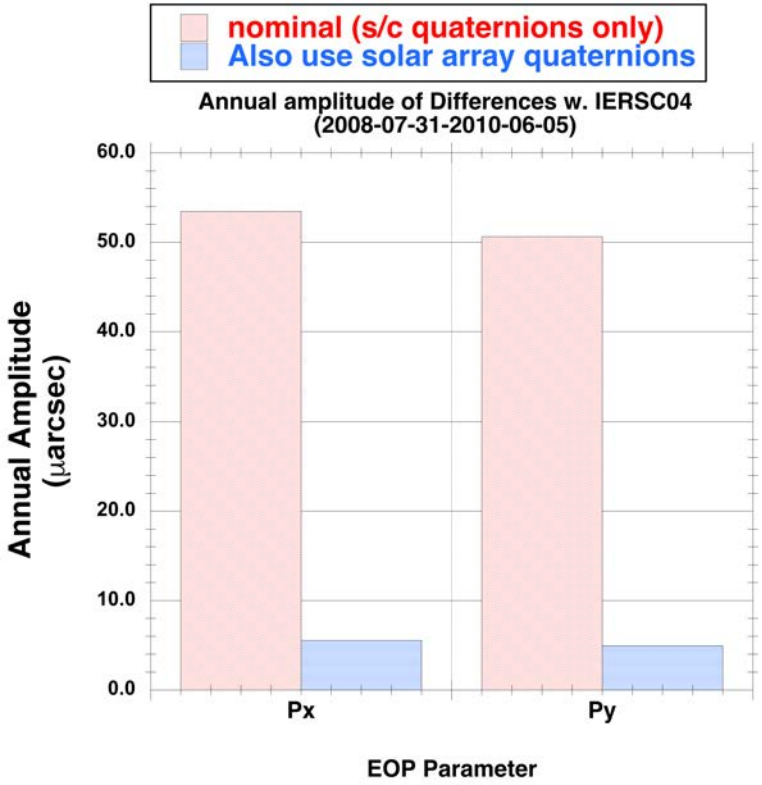
SLR RMS residuals difference shows improvement, except for cycle 4.

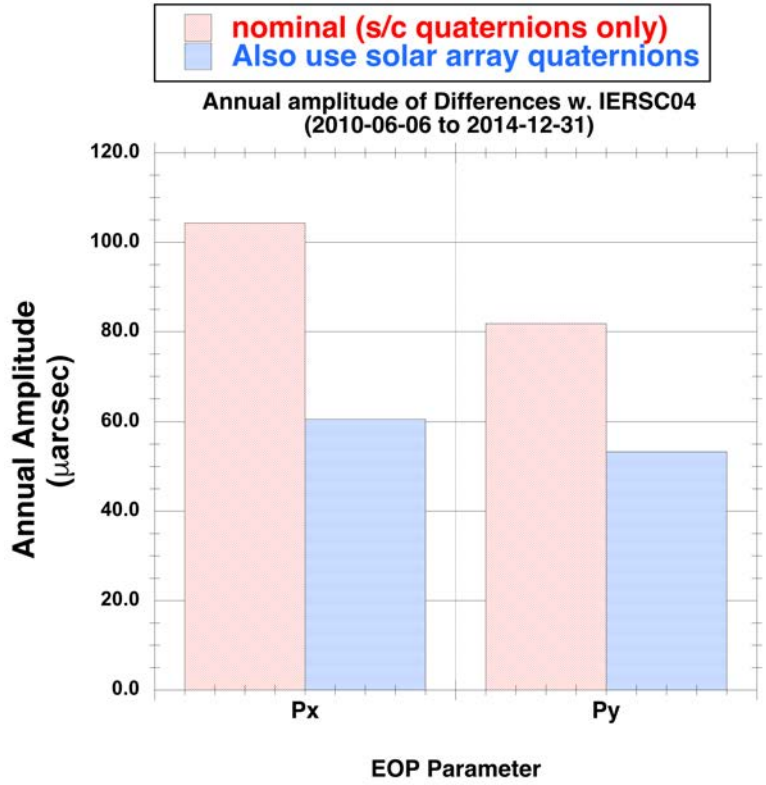
DORIS SINEX solution EOP Comparisons w. IERSC04





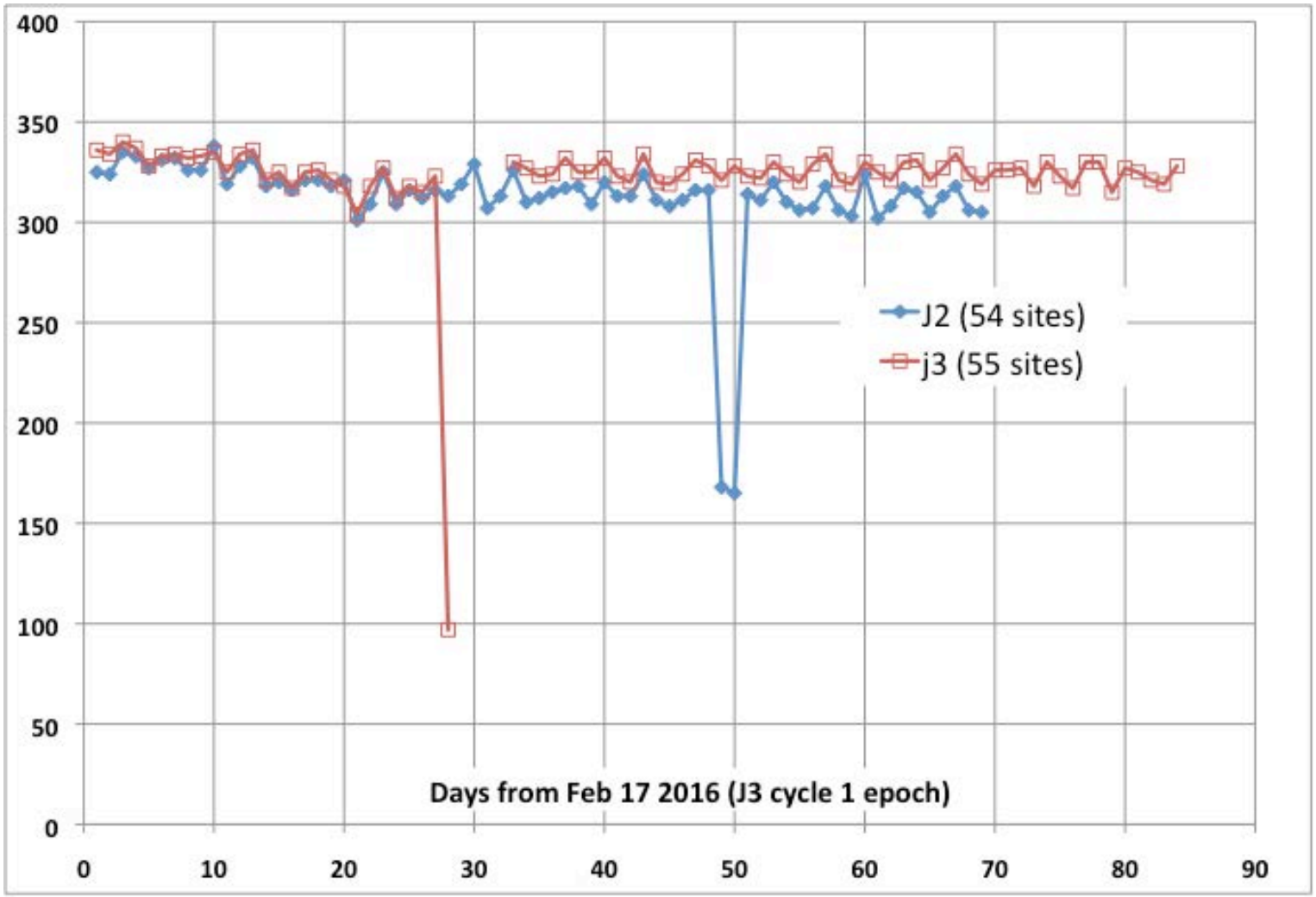
DORIS SINEX solution EOP Comparisons w. IERSC04



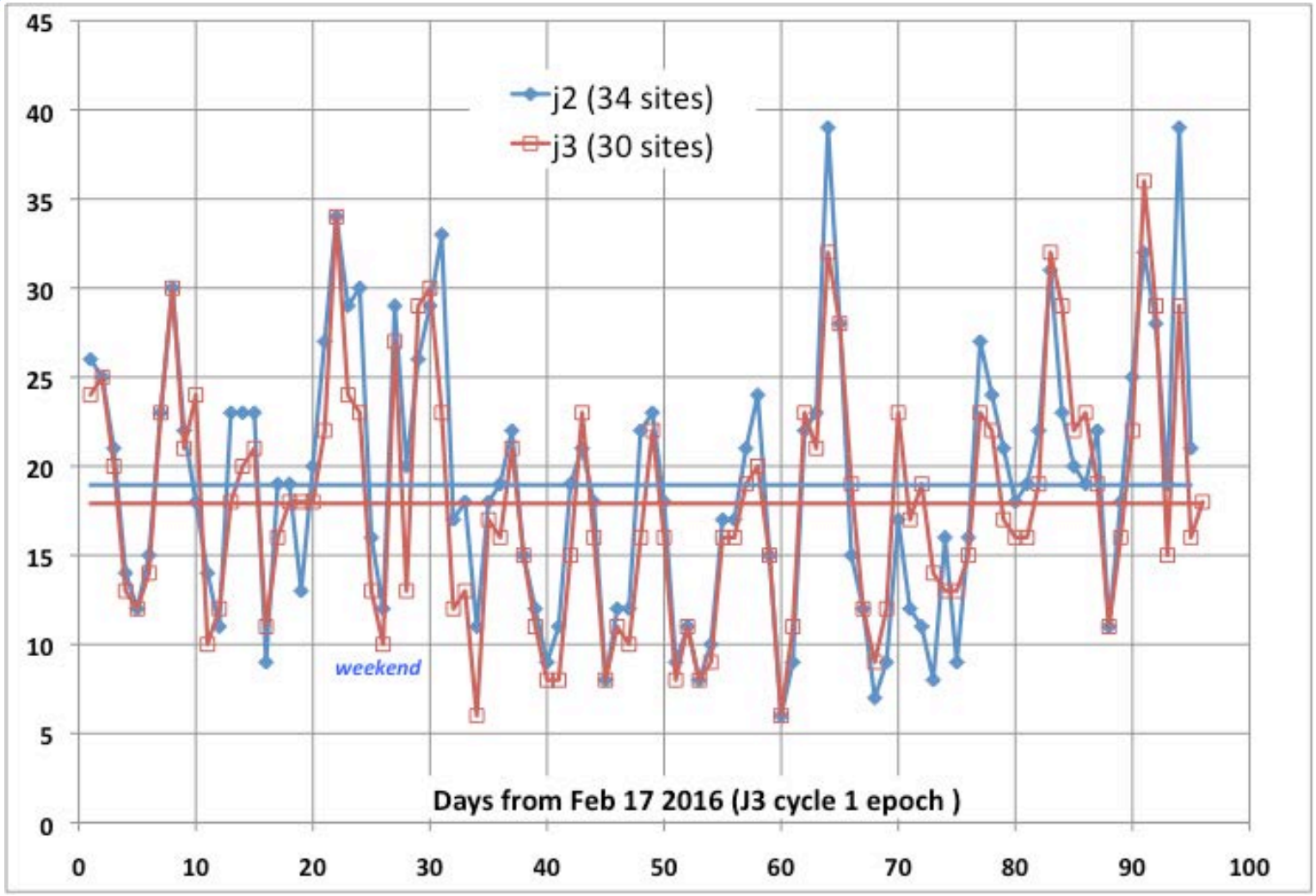


SRP Mismodelling caused by not using SA quaternions maps into EOP parameters; After addition of Cryosat-2 & HY-2A, annual amplitude of differences intensifies (mismodeling on these satellites?)

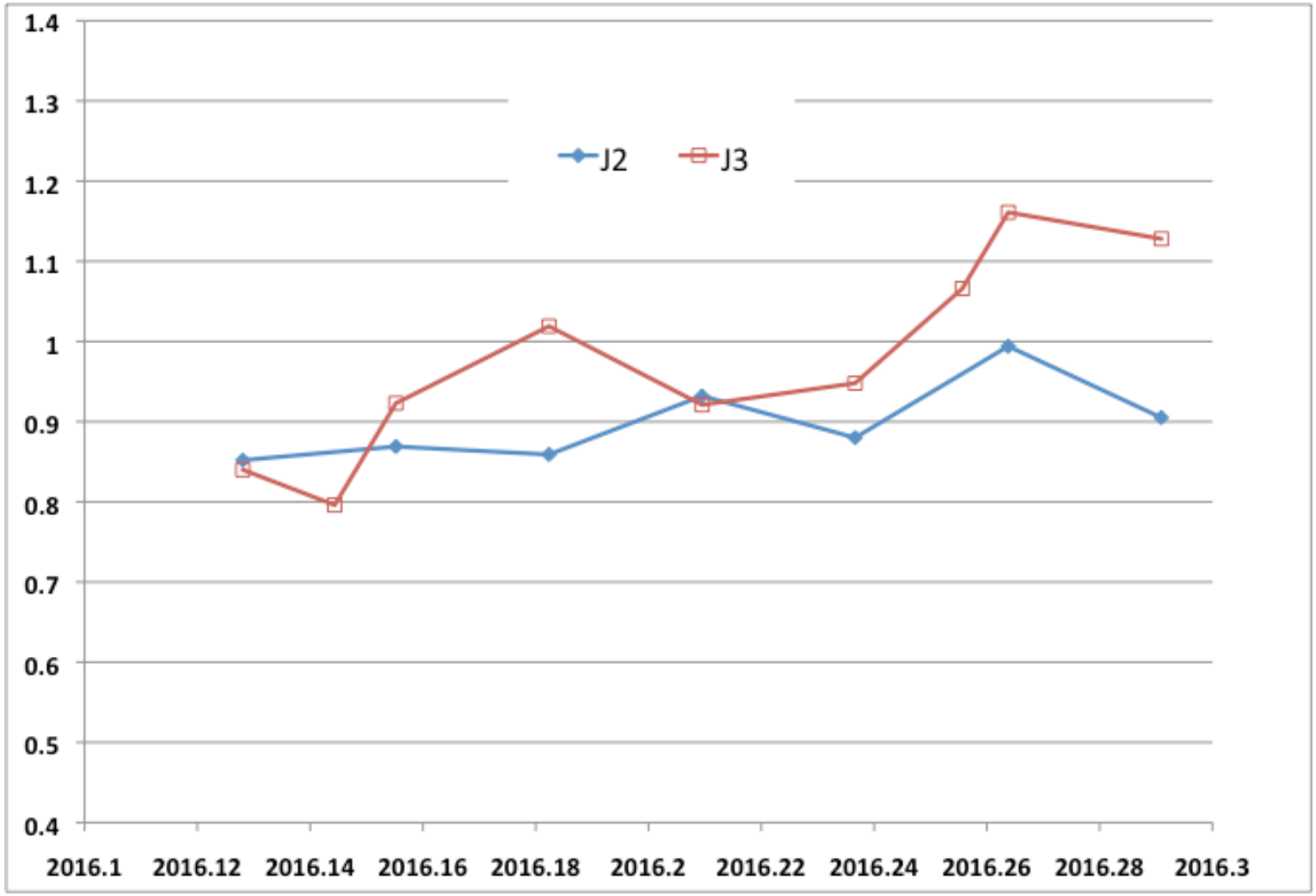
Jason-2/3 DORIS passes per day: Feb 17 – May 10 2016
last import: May 20



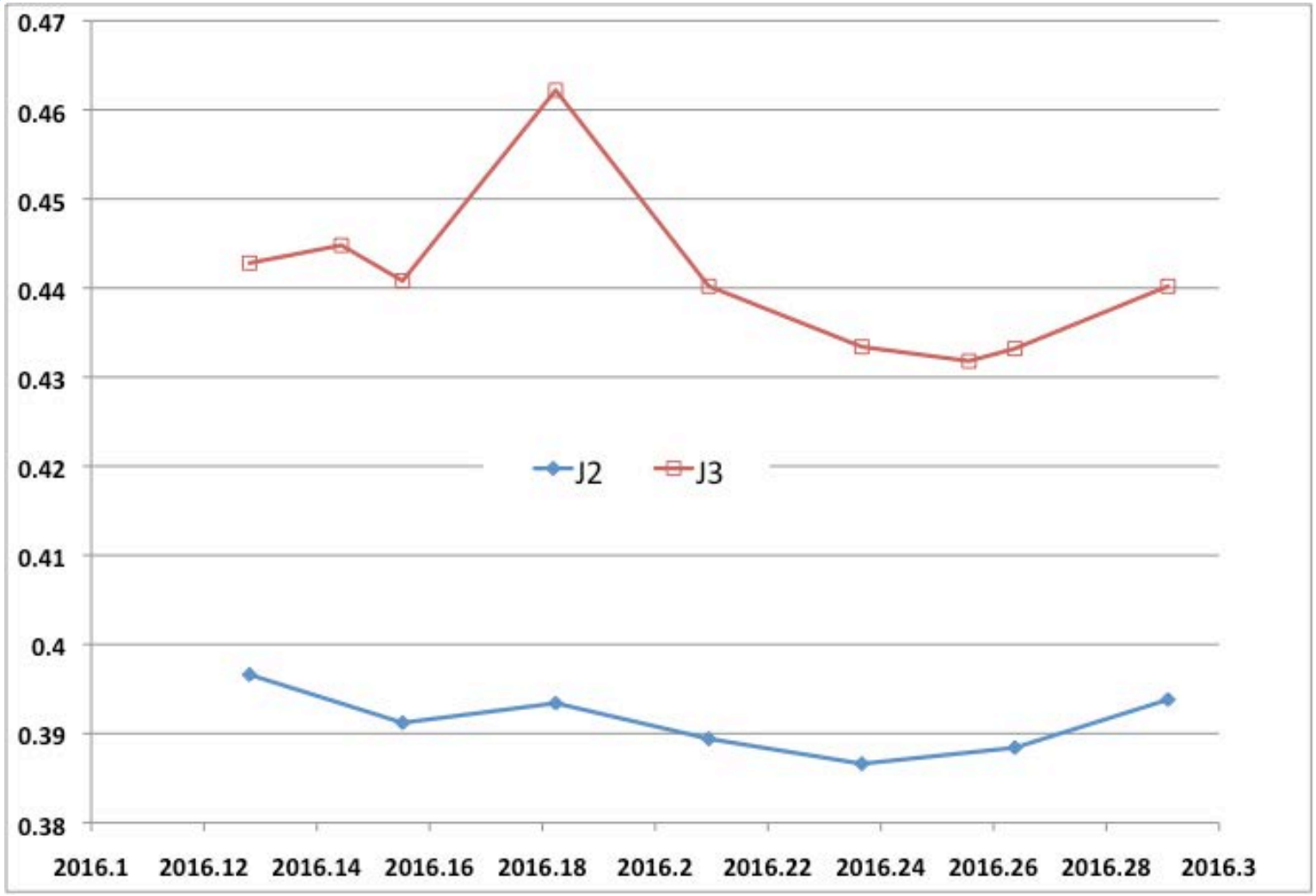
Jason-2/3 SLR passes imported per day: Feb 17 – May 22 2016; last import: May 22



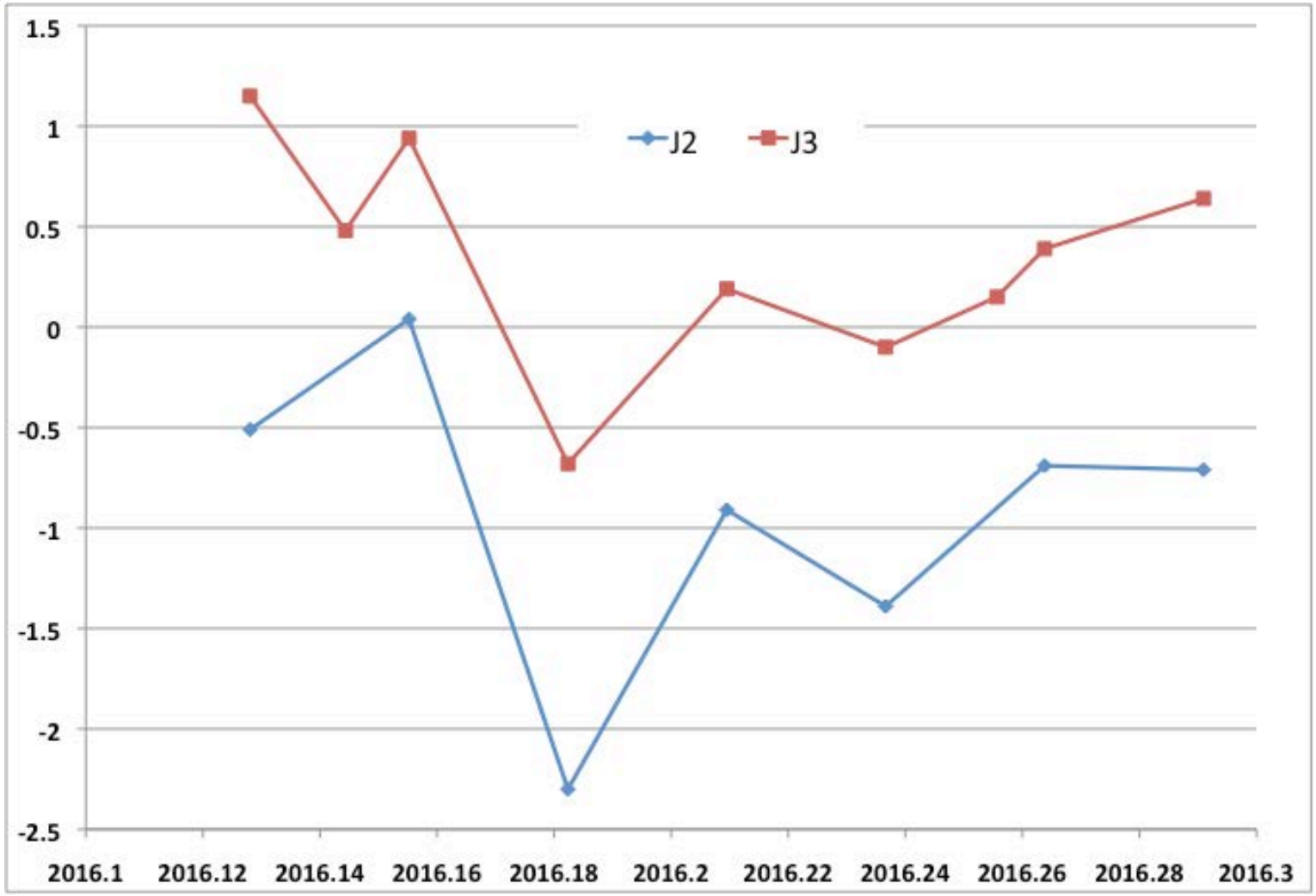
Jason-2/3 SLR residuals / arc (cm)
SLR+DORIS std1504 (J3 cycles 1-7)



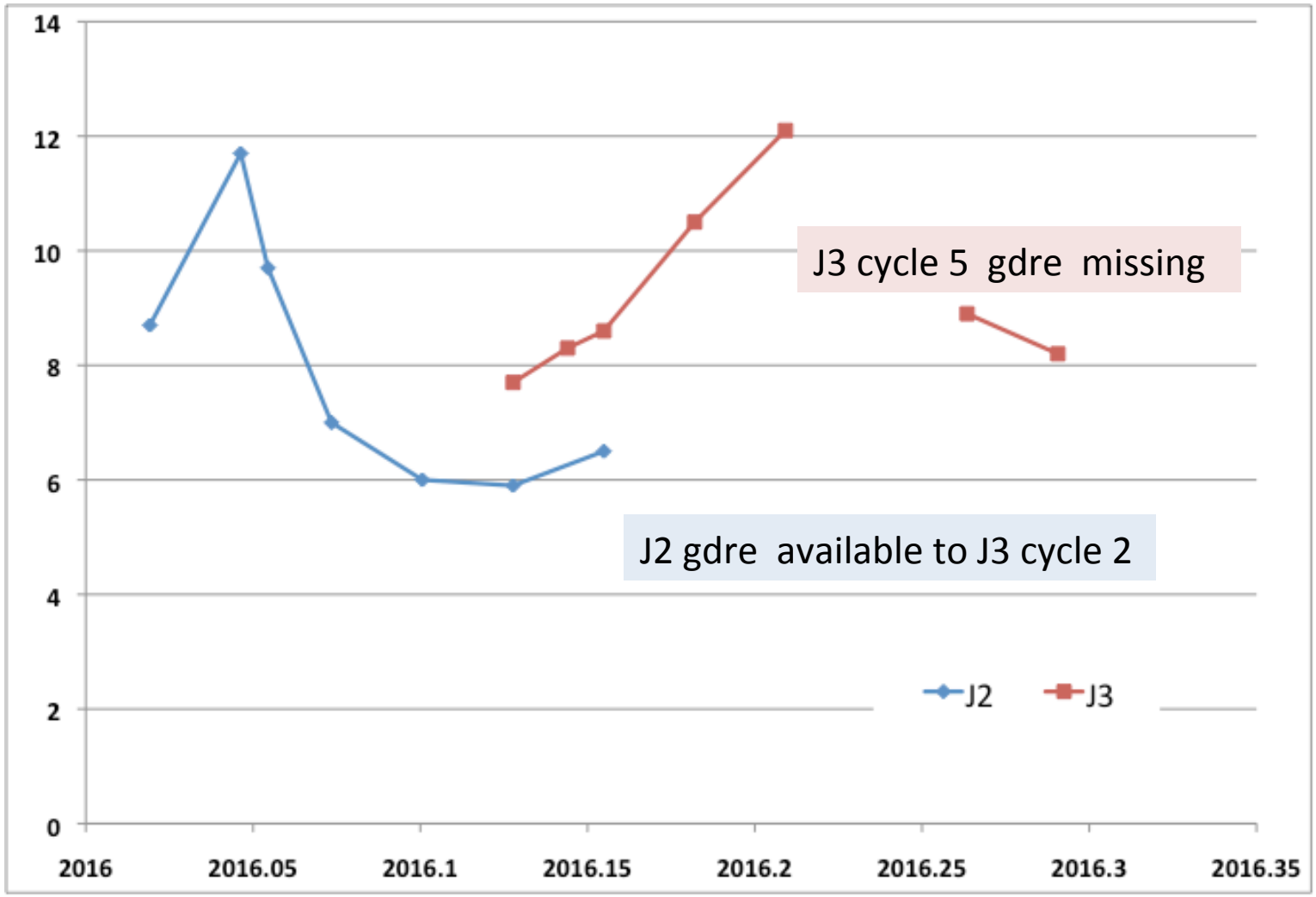
Jason-2/3 DORIS residuals / arc (mm/s)
SLR+DORIS std1504 (J3 cycles 1-7)



Jason-2/3 DORIS time bias (µsecs)
SLR+DORIS std1504 (J3 cycles 1-7)

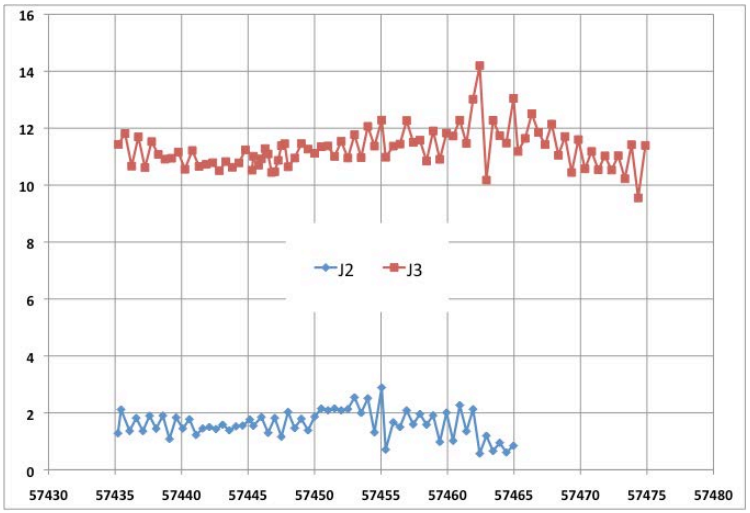


Jason-2/3 std1504-gdre RMS Radial orbit differences (mm)
last CDDIS import: May 22

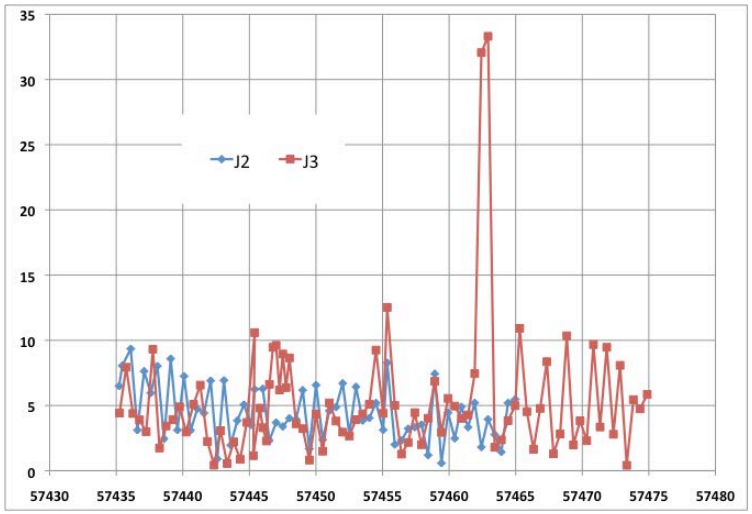


Jason-2/3 OPR accels amplitude (nm/s^2)
SLR+DORIS std1504 (12-hour OPR)

Along-track

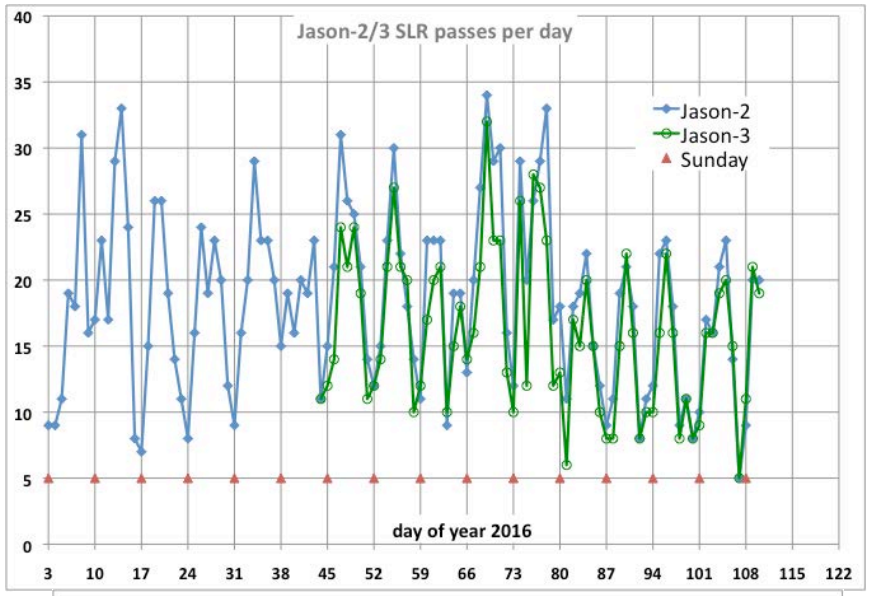


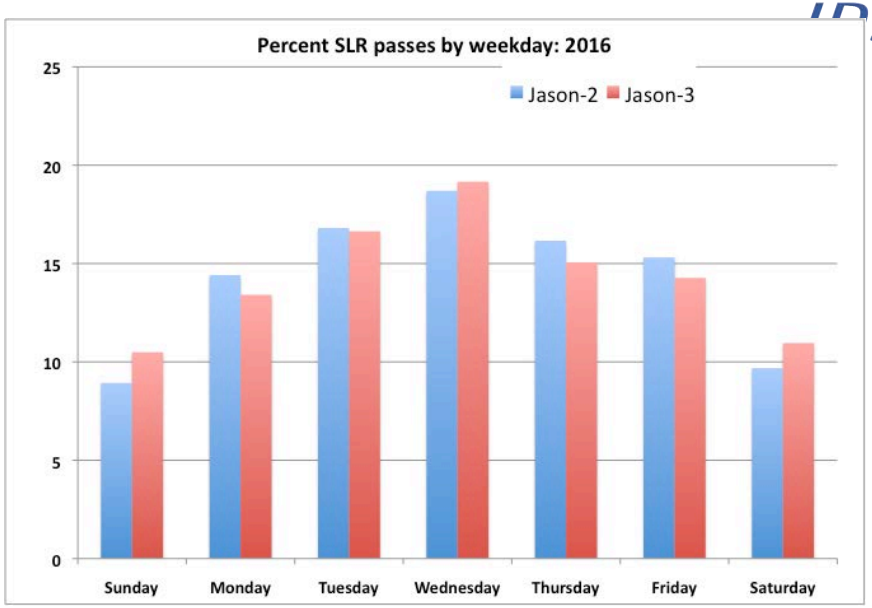
Cross-track

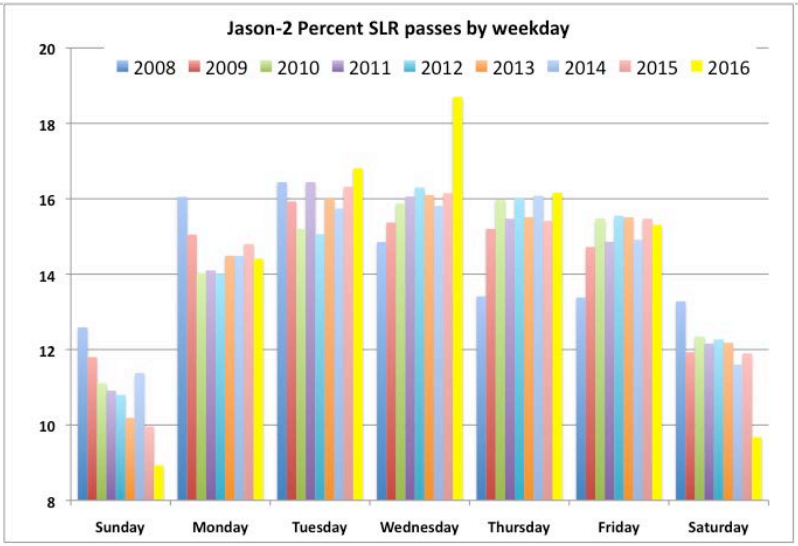


Tuned Cr used for Jason-2;
Cr for Jason-3 is untuned.

Jason-2/3 SLR Tracking Statistics



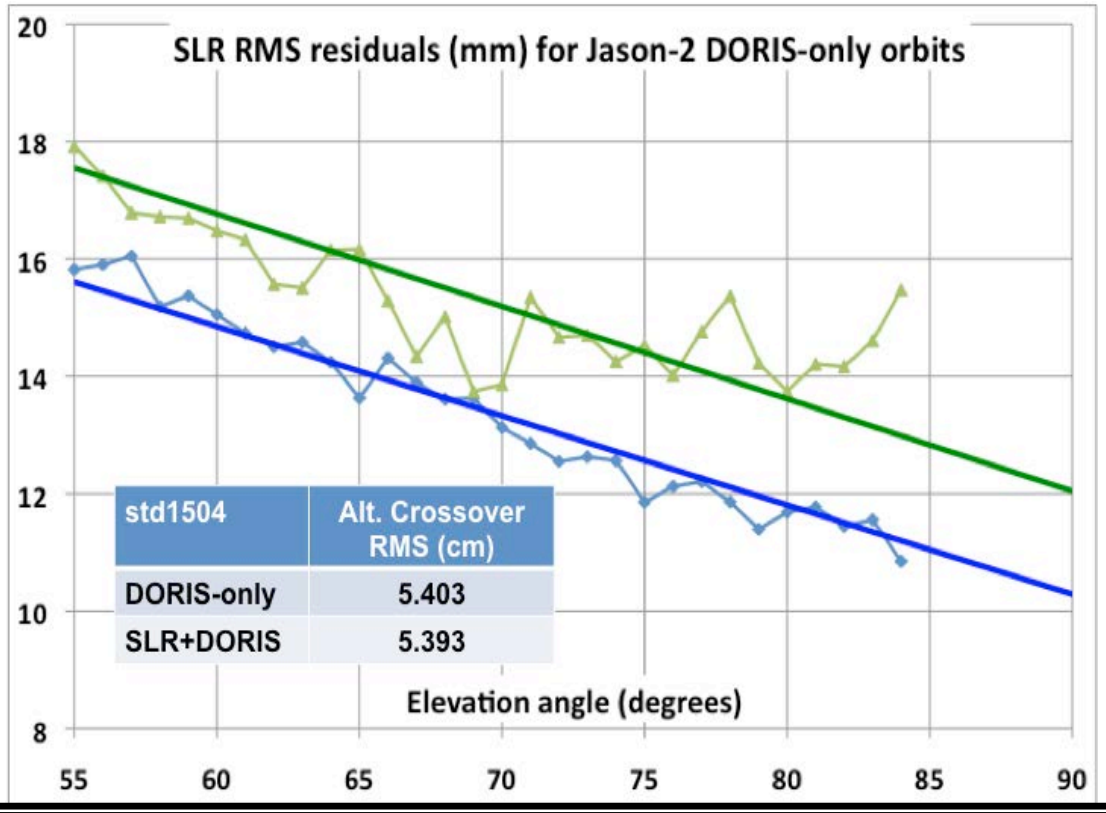




SLR data have a pronounced "weekend effect" – it is slightly more pronounced in 2016 than in previous years on Jason-2.

- The "weekend effect" is not a new phenomenon.
- This is one more reason why DORIS data (in combination with SLR) are so important.

Jason-2 SLR Residuals (DORIS-only orbits)



- DORIS-only orbit SLR Residuals for **std1007** (*before updates for ITRF2014 reprocessing, especially with TVG*) and **std1504** (*ITRF2014-reprocessing standards*).
- High-elevation residuals indicate DORIS-only Jason-2 orbits now have ~1.2 cm radial orbit accuracy.