Some GSC Jason-1 & Jason-2 POD Results

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Issues

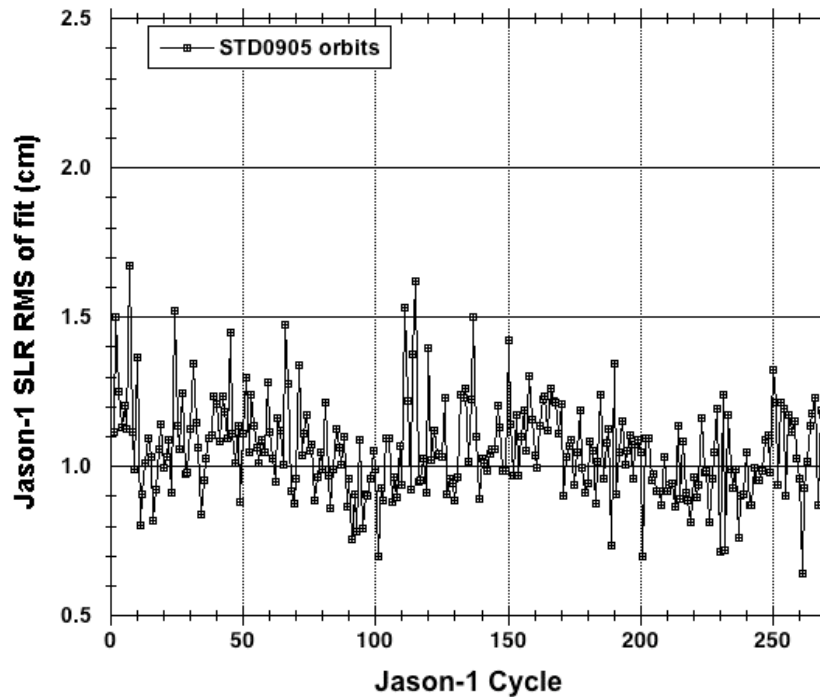- Jason-1 POD Results.
  - RMS of fit with SAA model.
  - Stability of USO1 & USO2 &
  Z offset estimation.
  - Effect on SLR+DORIS orbits.
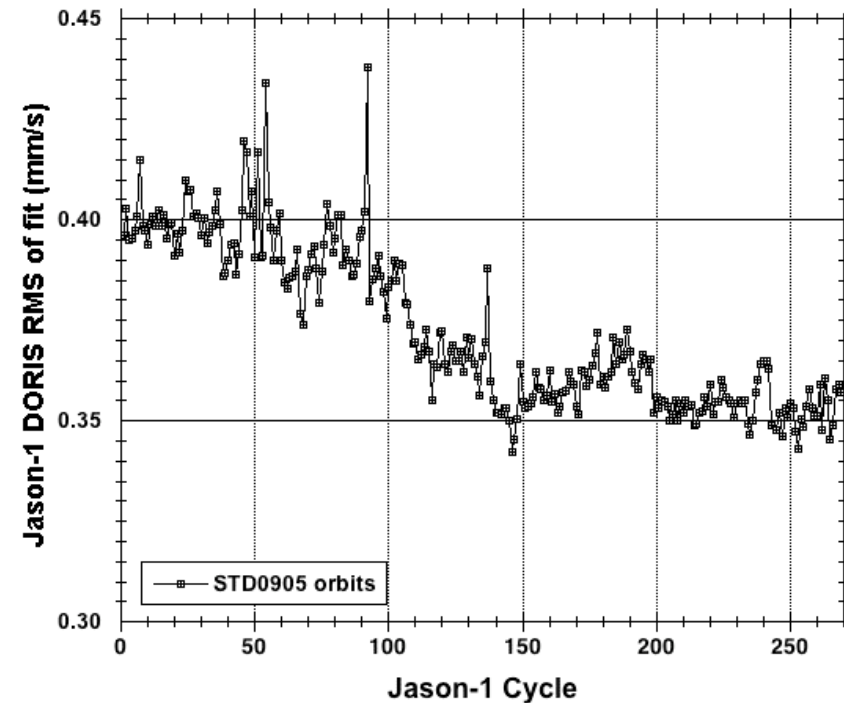
- Jason-2 POD Results

Jason-1 RMS of fit summary
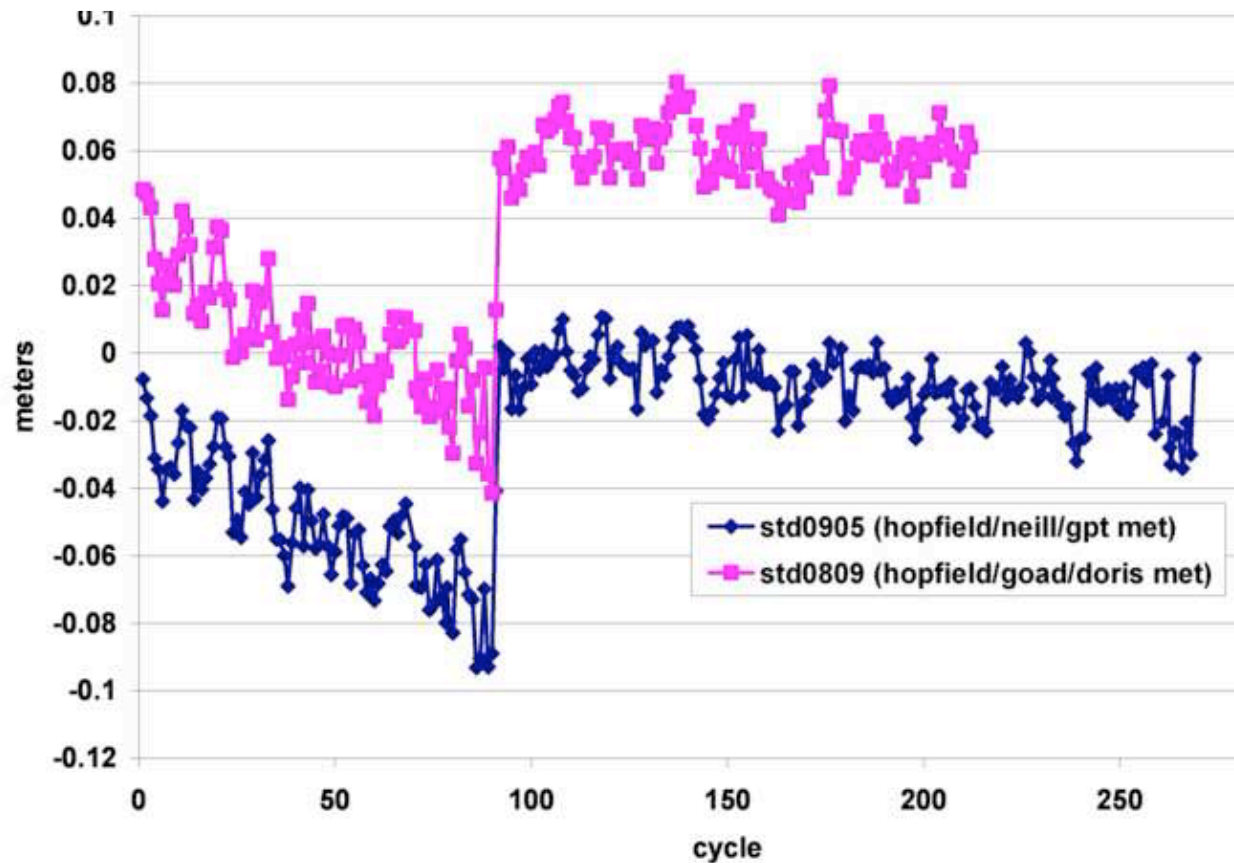# (gsc std0905 SLR/DORIS orbits)

Avg. RMS of fit: ~1.06 cm

Avg. RMS of fit: ~0.39 mm/s, USO1
Avg. RMS of fit: ~0.36 mm/s, USO2

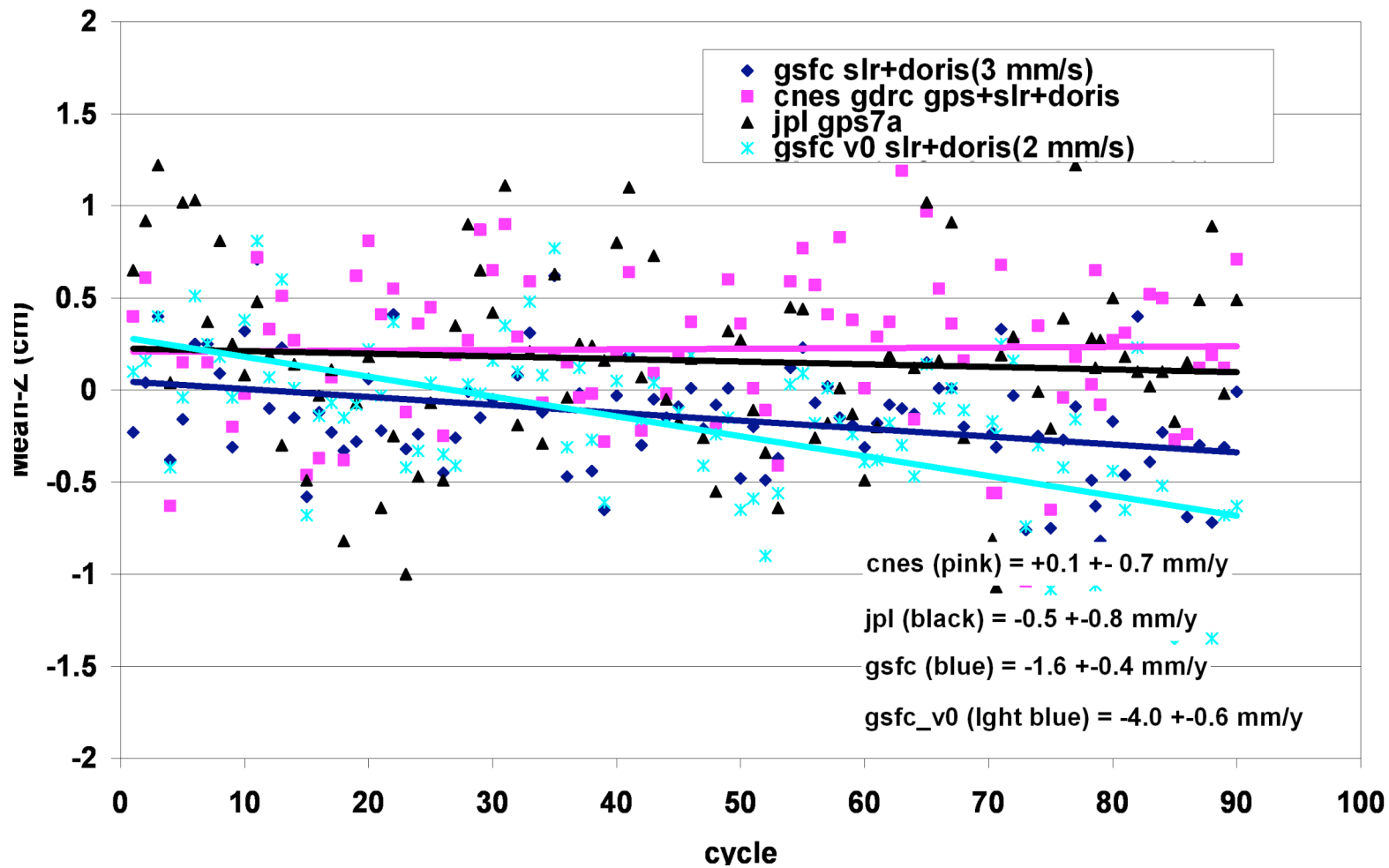# 10-day (per cycle) Estimation of Jason-1 DORIS Antenna Z-offset

(Cycle 1 to 235. From January 2002 to May 2008)
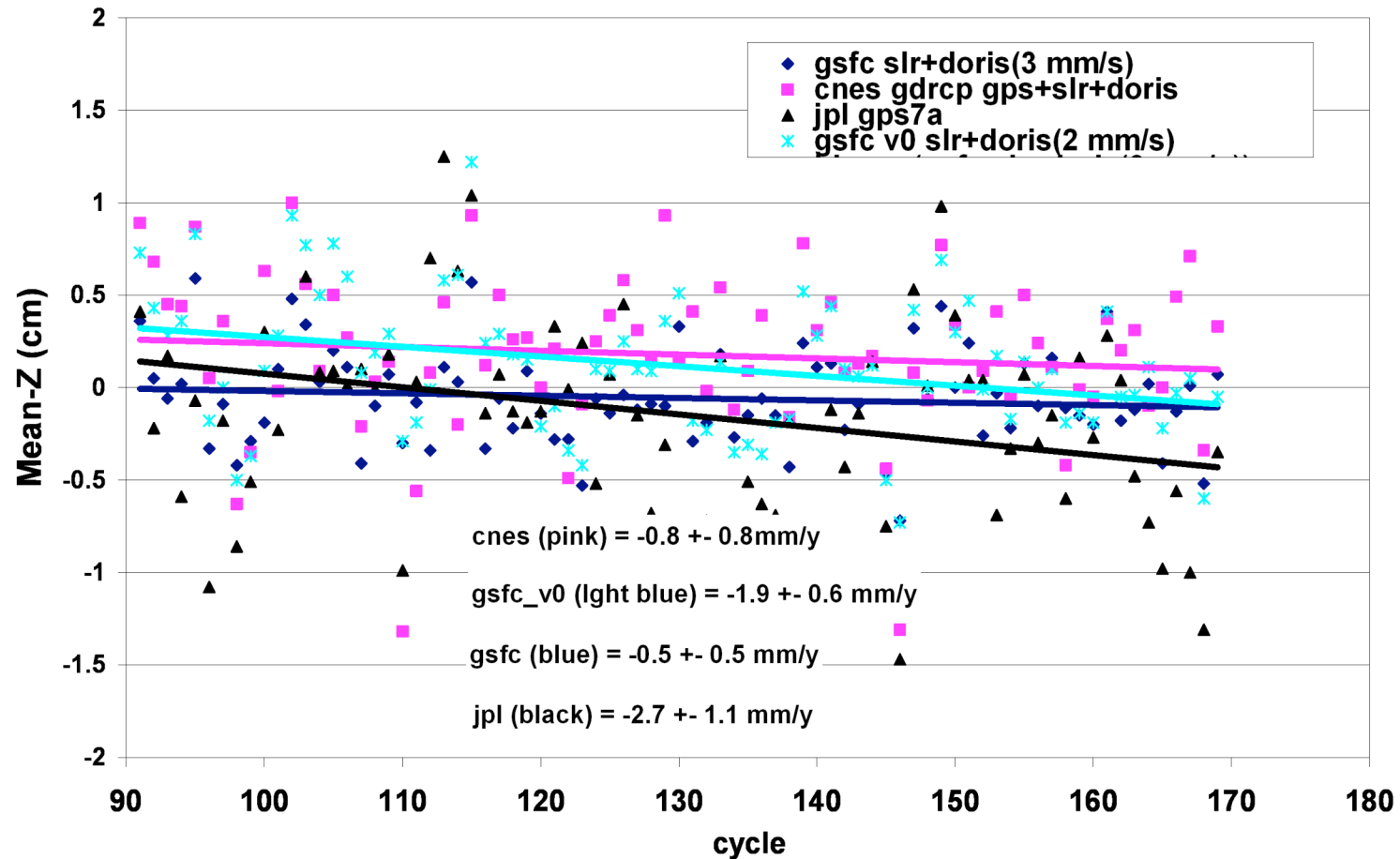
Jason-1 Mean Z Orbit Differences

(SLR/Crossover vs. test orbits: cycles 1-90)

cnes (pink) = +0.1 +- 0.7 mm/y

jpl (black) = -0.5 +-0.8 mm/y

gsfc (blue) = -1.6 +-0.4 mm/y

gsfc_v0 (lght blue) = -4.0 +-0.6 mm/y

Legend:
- gsfc slr+doris(3 mm/s)
- cnes gdrc gps+slr+doris
- jpl gps7a
- gsfc v0 slr+doris(2 mm/s)

J1J2 POD Results, Lemoine et al., DORIS AWG, Darmstadt, May 26-27, 2010

Jason-1 Mean Z Orbit Differences
(SLR/Crossover vs. test orbits: cycles 91-169)

Legend:
- ♦ gsfc slr+doris(3 mm/s)
- ■ cnes gdrcp gps+slr+doris
- ▲ jpl gps7a
- ✕ gsfc v0 slr+doris(2 mm/s)

cnes (pink) = -0.8 +- 0.8mm/y

gsfc_v0 (lght blue) = -1.9 +- 0.6 mm/y

gsfc (blue) = -0.5 +- 0.5 mm/y

jpl (black) = -2.7 +- 1.1 mm/y

X-axis: cycle
Y-axis: Mean-Z (cm)

Jason-1 Summary

- For POD altimetry orbits, how does one compute a consistent orbit time series? We need a combination of SLR, DORIS & GPS data - because each geodetic data type on J1 has had issues over different phases of mission. (e.g. GDRC).
- Jason-1 USO-2 is more stable than USO-1. This may be luck or due to its activation during lower intensity phase of solar cycle - or both.
- Therefore, effect on coordinate estimation & geodetic products will be most pronounced for USO-1 (cycle 1-90 than later cycles - > cycle 91). We need to evaluate systematically if we can (or should) include Jason-1 in future ITRF solutions.
- It is conceivable J1 might be allowed to contribute to EOP but not coordinate solutions …. Or we might reduce (backsubstitute) the SAA Jason-1 stations from coordinate solutions. ===> Evaluate and make tests before the next ITRF …
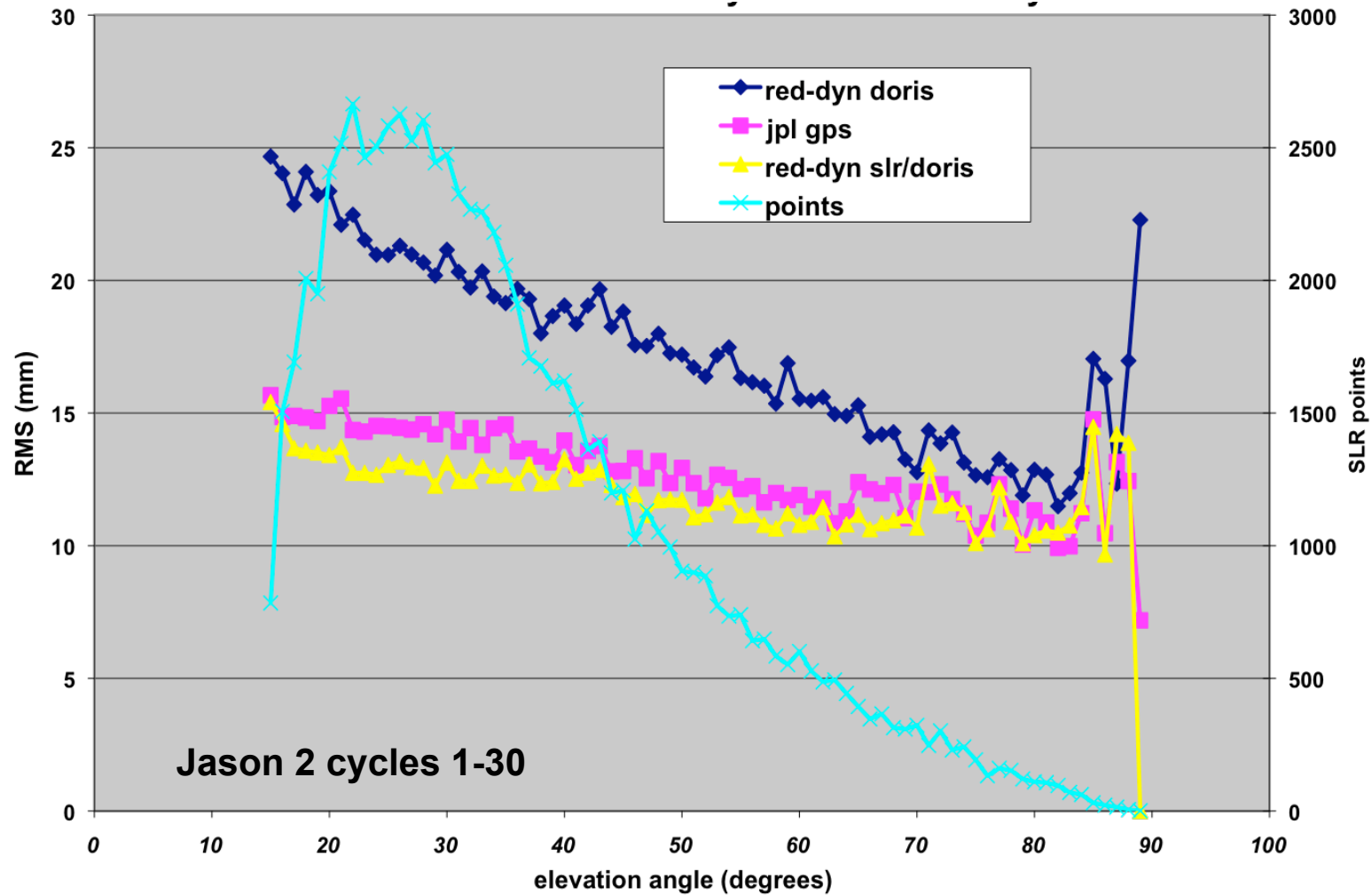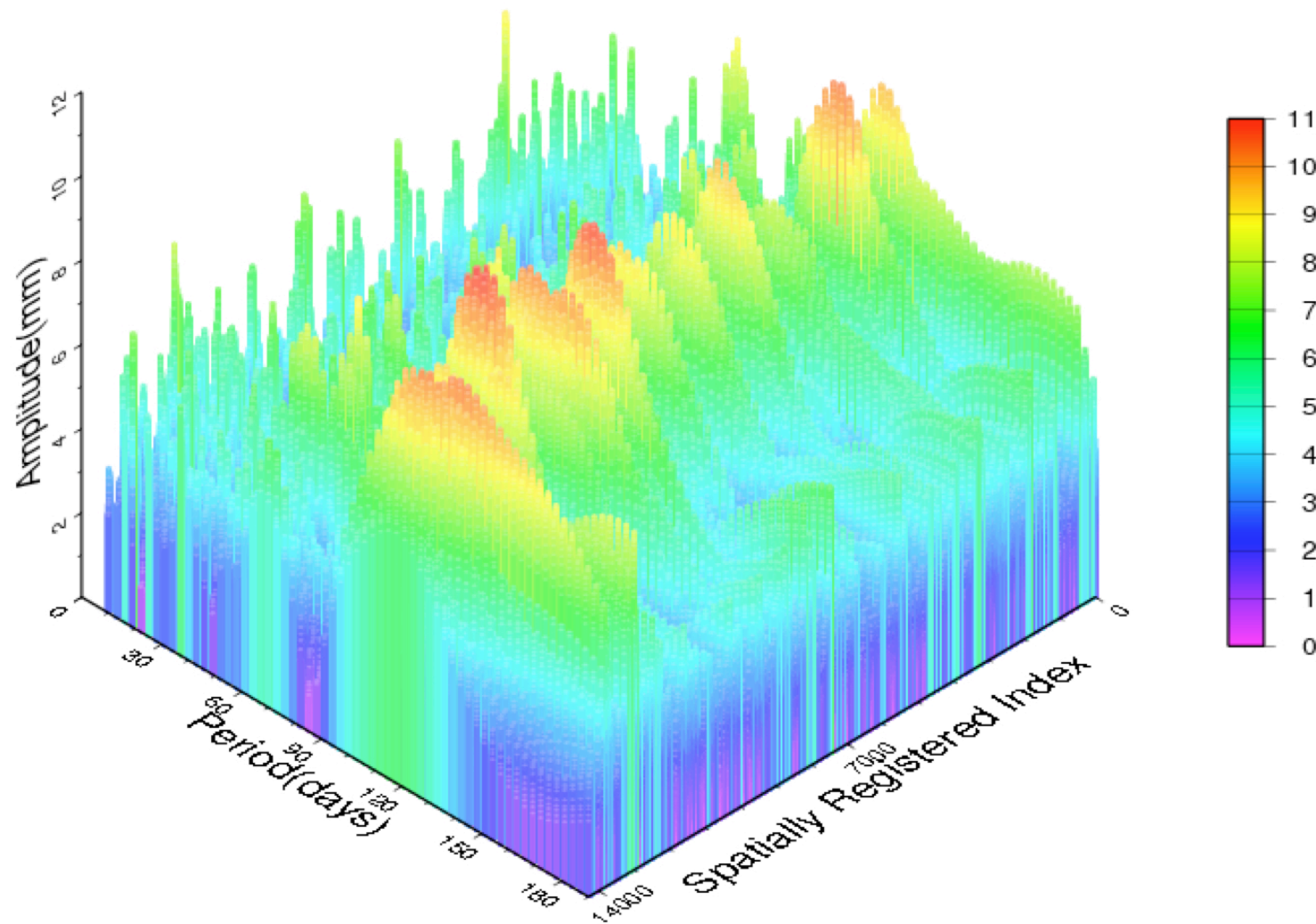
Jason1 & Jason2 Data Distribution vs. Elevation Angle
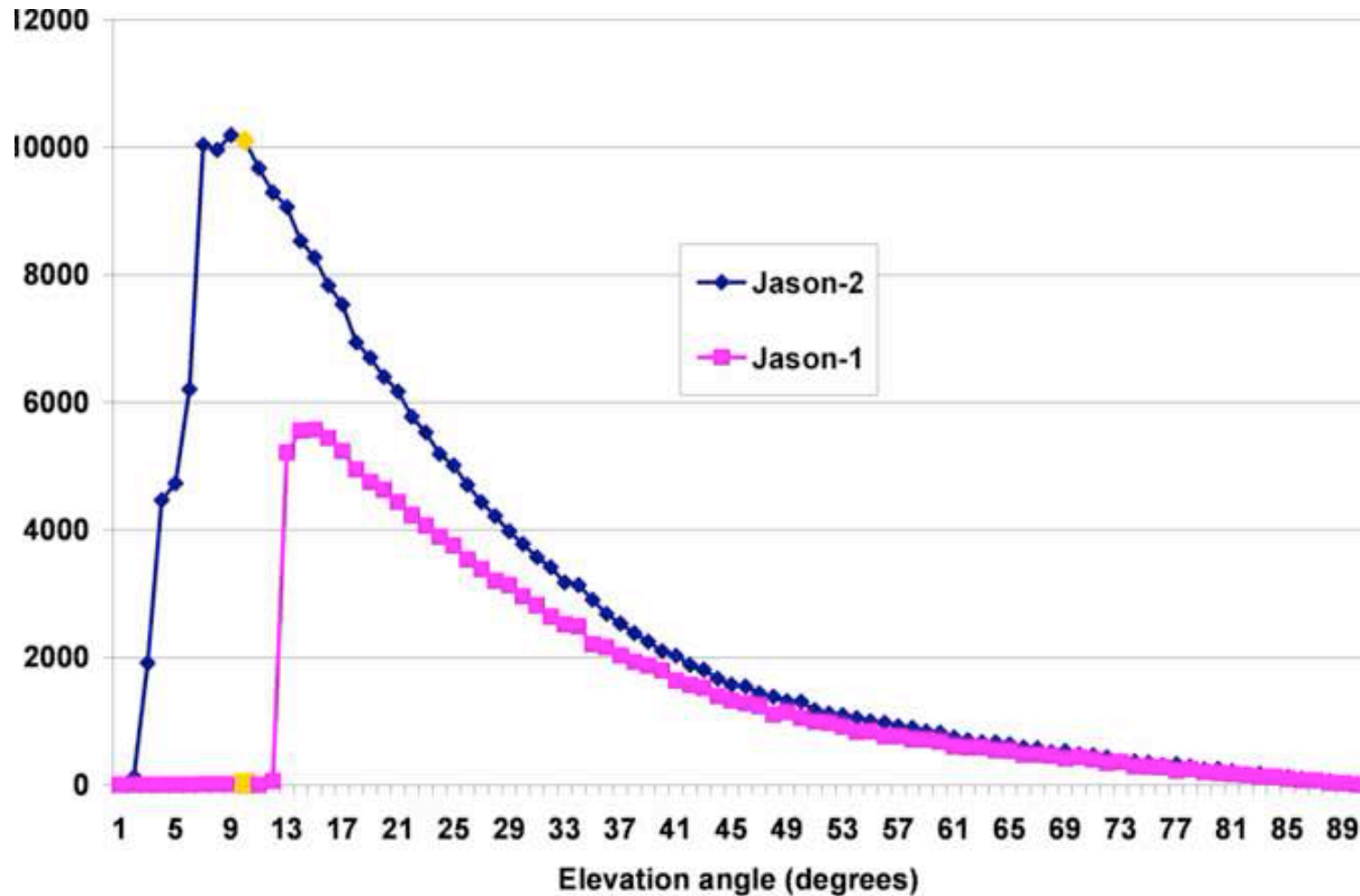
SLR Residuals for Reduced-dynamic orbits

Jason-2 JPL GPS_09a - GDRC
radial orbit differences (cycles 1-40)
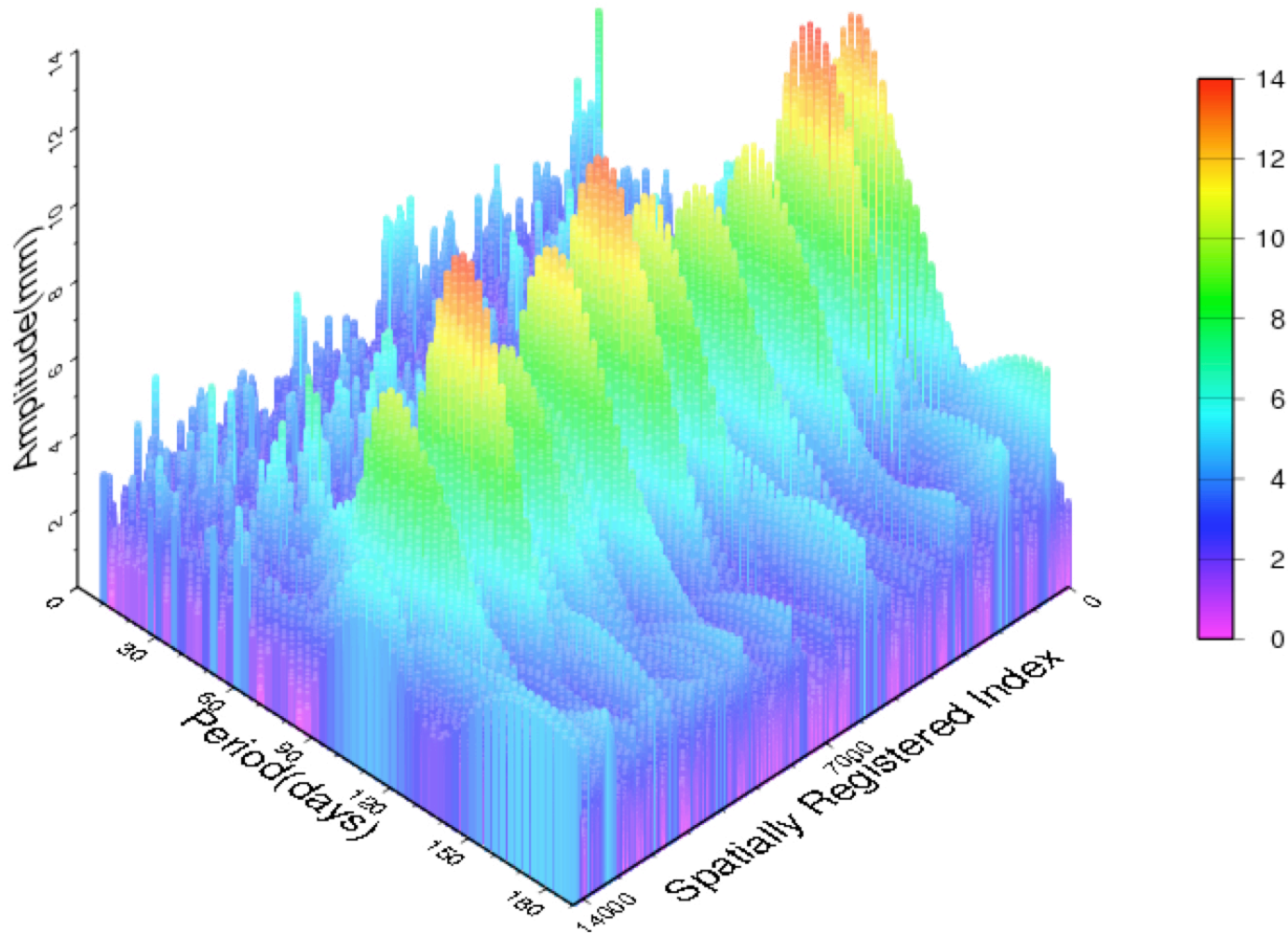## (spectral analysis at spatially registered points)

Jason-2 JPL GPS_09a - STD0905 RD
radial orbit differences cycles 1-40
(spectral analysis at spatially registered points)

Jason-2 JPL GPS_09a - STD0905 RD radial orbit differences cycles 1-40

(spectral analysis at spatially registered points: 2D projection)