







Analysis of the Signal Content in the Coordinate Time series of the DORIS stations

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- Series: esa10, gop43, grg40, gsc26, ign15, ina10 and ids09.
- For each series, the estimation of the signal content of the DORIS coordinate time series consisted in 6 steps:
 - 1. Construction of the DORIS position and velocity cumulative solution over the time period 1993.0-2015.0. The position discontinuities and velocity constraints are the same as in Moreaux et al. (2016).
 - 2. Estimation of the DORIS station position residuals (differences between the coordinate time series and the mean velocities).
 - 3. Selection of the residuals from Jason-2 including (2008/06/20).
 - 4. Gathering of residuals per DORIS site.
 - 5. Rejection of sites with less than 120 weeks or with mean time interval larger than 10 days.
 - 6. Estimation of the top 25 periodic signals w.r.t. S/N ratio larger than 2. Software: FAMOUS from Mignard (2005).







Main feature: Jason-2 dracontic in all the directions.

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Main feature: Jason-2 draconitic in all the directions.

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GRG 40



Main feature: Jason-2 draconitic in all the directions.

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GSC 26

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Main feature: Jason-2 draconitic and first overtone in the North direction.







Main feature: Jason-2 draconitic and first overtone in all the directions.







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Up signal content



ERA inHyd = Atmospheric and hydrologic loading from ECMWF ERA Interim reanalysis. Weekly time series at DORIS sites from J.P. Boy.

□ Coherence between IDS 09 and atmosphere and hydrologic annual signals in Yellowknife, Badary, Kitab and Krasnoyarsk. Higher amplitudes for IDS 09 in Cachoeira, Kourou, Santiago and Hartebeesthoek may be explained the South Atlantic Anomaly sensibility of SPOT-5, Jason-1 and Jason-2 Ultra Stable Oscillators.

□ Differences with ITRF2014 estimations may reflect differences in the time span as well as in the estimation strategy. [∞]







Conclusions

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- The East component shows higher amplitudes at lower frequencies. This is most likely a consequence of the orbit configuration for the DORIS satellite constellation.
- The IDS NEU coordinate time series show annual, semi-annual and 117.3-day (Jason satellite draconitic) periodic signals.
- Overtones (58.7 days, 29.3 days) of the Jason draconitic period are also observed in the three components (NEU).
- The Jason draconitic is most likely explained by mismodeling of the solar radiation pressure, however errors in the DORIS measurement model could also contribute at some level.
- Maps of the amplitudes of the periodic signals show geographic regional coherences (North America, West Eurasia, Europe).
- The smallest amplitudes are obtained for the stations situated on islands.
- Next: analysis of the new GSC 28 series using new Jason-2 modelling.