Thermal S1-tide in the atmospheric angular momemtum and Polar motion

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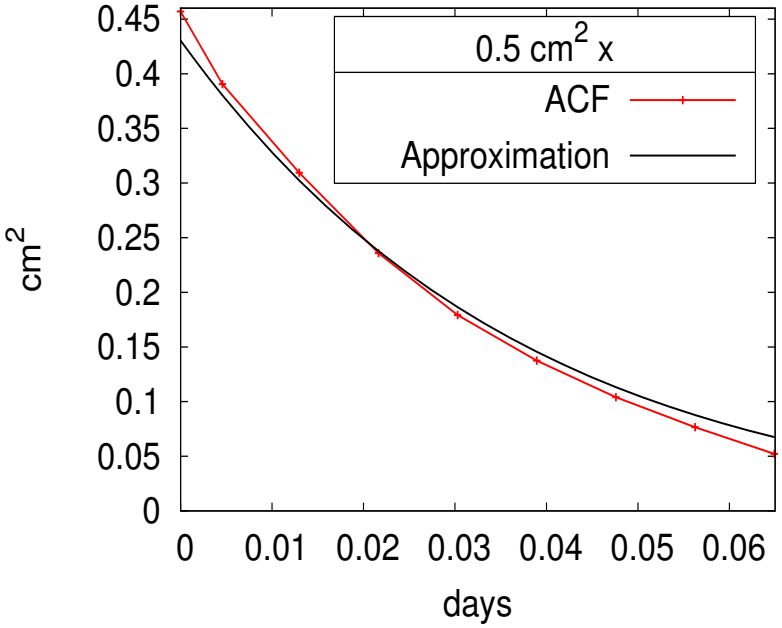
Introduction

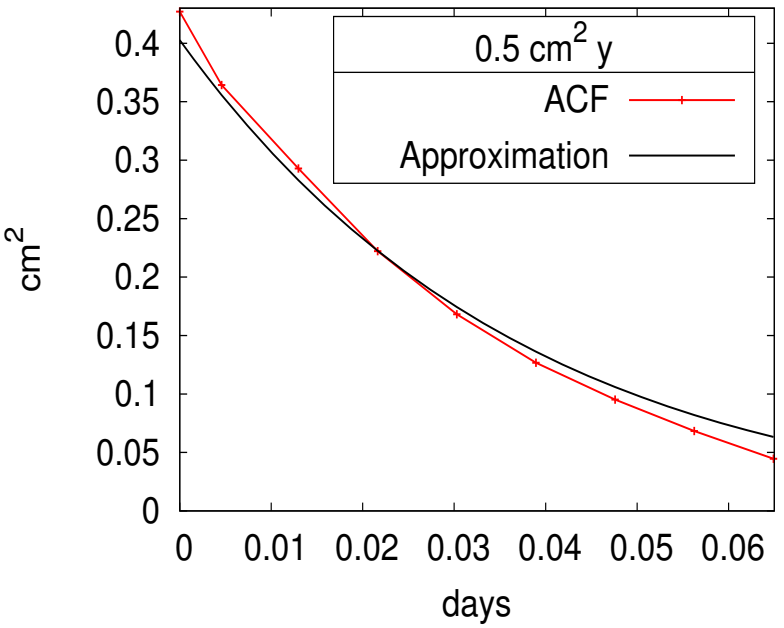
- S1-tide
- Earth Orientation Parameters time series from VLBI-observations
- Different Atmospheric Angular Momentum time series
- Comparison between S1 in EOP and S1 in AAM

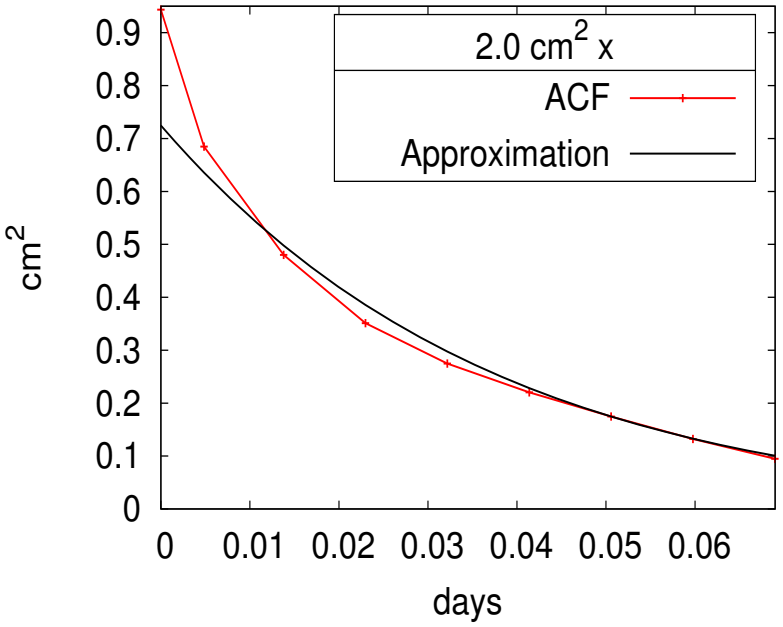
A priori Polar motion variance selection

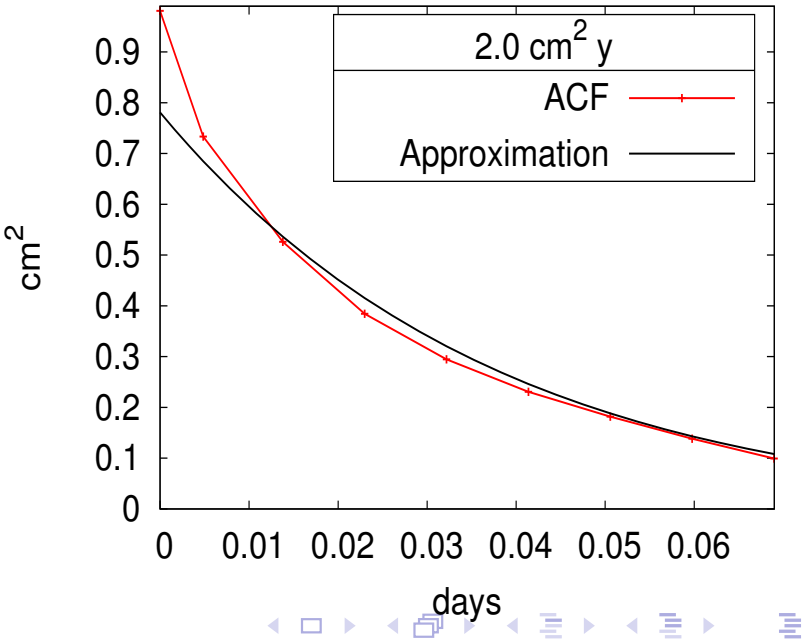
- Least squares collocation method requires a priori information
- Auto covariance function (ACF)
- We need to know a priori Polar motion variance

Approximations of ACF

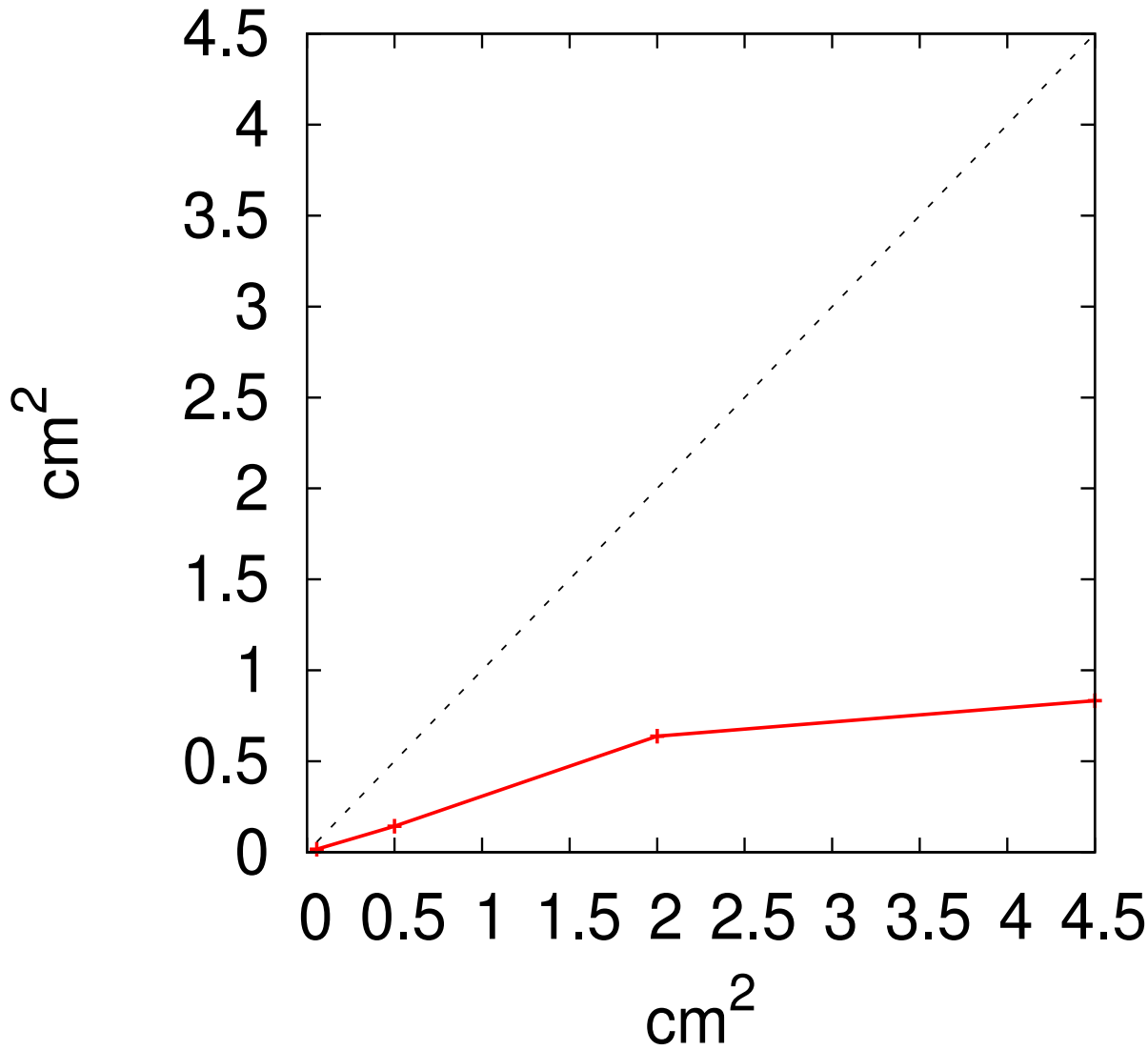








A priori and a posteriori variances



Future work

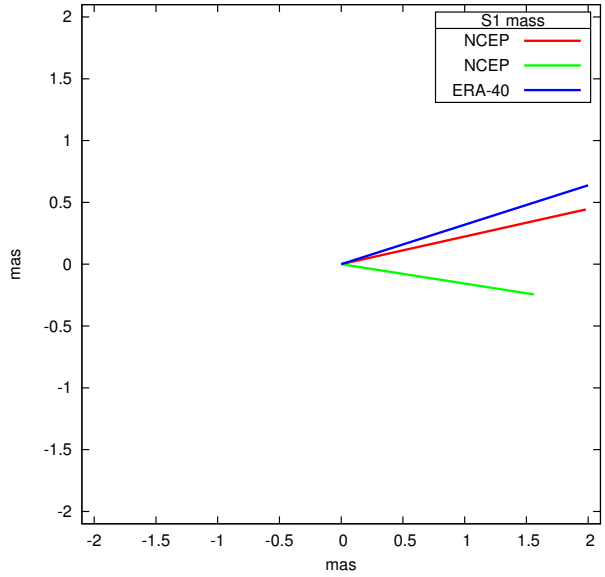
- Calculating ACF of noise
- If signal variance is underestimated, than polar motion signal leaks into noise
- If signal variance is overestimated, than noise variance is less than measurement error

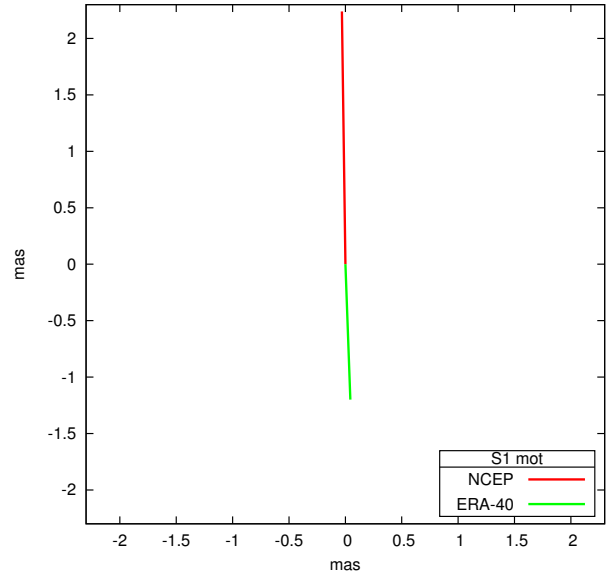
Amplitudes and phases estimations

- Earth rotation parameters estimation
  - Eans model for short periodic oceanic terms (IERS 2003)
  - Nutation model MBH-2000
  - Relativistic model IERS-1992
  - Hydrostatic delay by Marini
  - Calculate apriori delay from surface meteoparameters
- Complex demodulation
- Gaussian smoothing

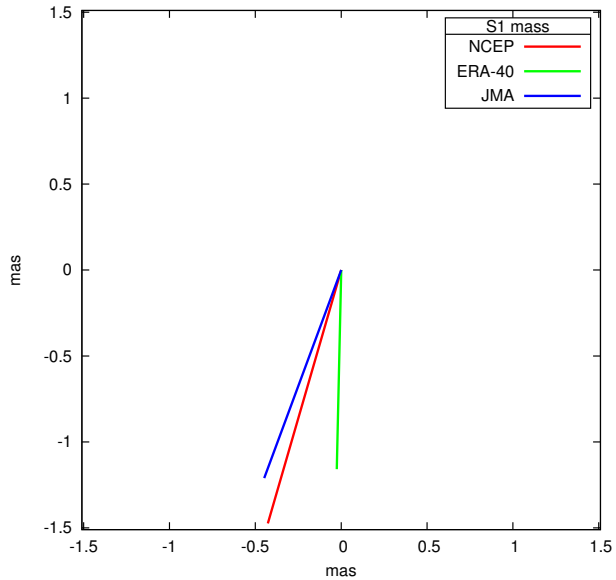
Old and new AAM

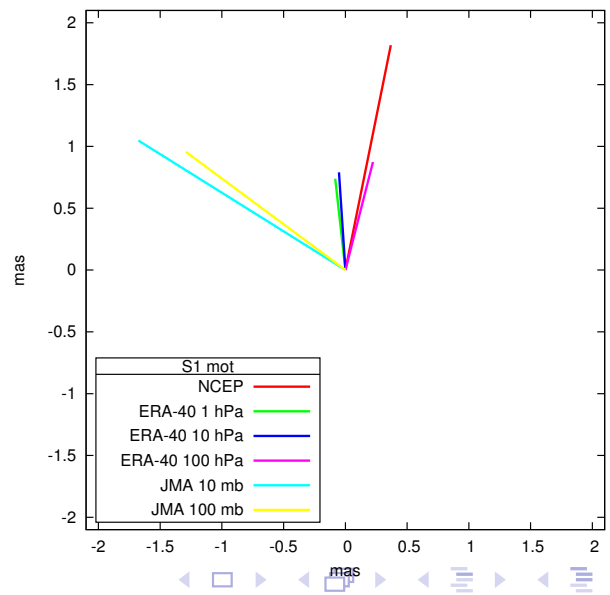
AAM before 2005



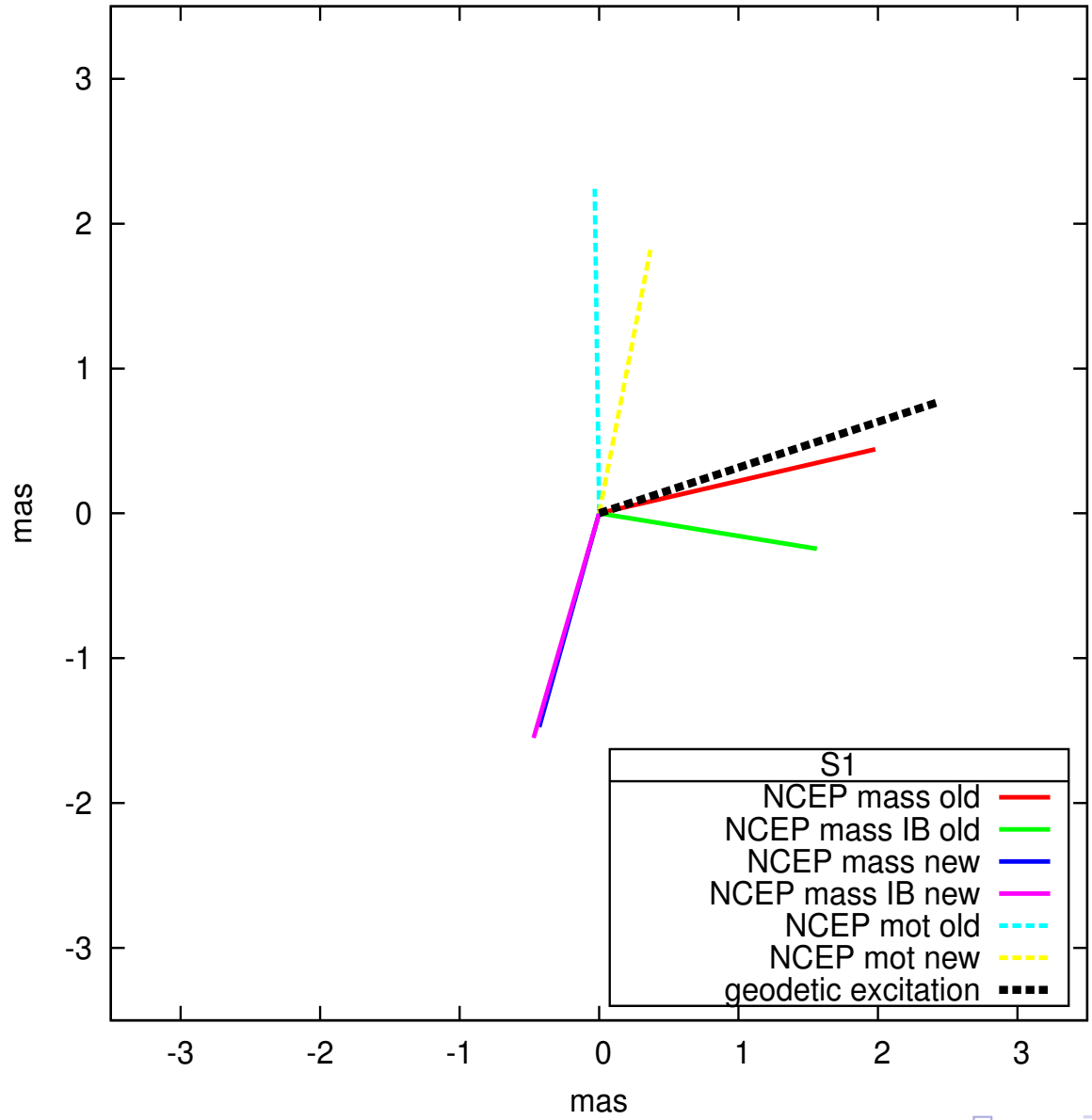


AAM after 2005





Comparison of S1-tide in the atmospheric angular momentum and Polar motion



Summary

- An objective algorithm of the a priori Polar motion variance selection will be worked out
- Time series of Earth orientation parameters (EOP) with subdiurnal resolution were estimated from reanalysis of the Very Long Base Interferometry (VLBI) observations
- Different AAM time series were analyzed
- Amplitudes and phases of S1-tide in AAM and Polar motion were estimated
- Comparison of S1-tide in the atmospheric angular momentum, the ocean tide angular momentum and Polar motion was made

Thank you for your attention!