

Geophysical fluids modeling

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Content

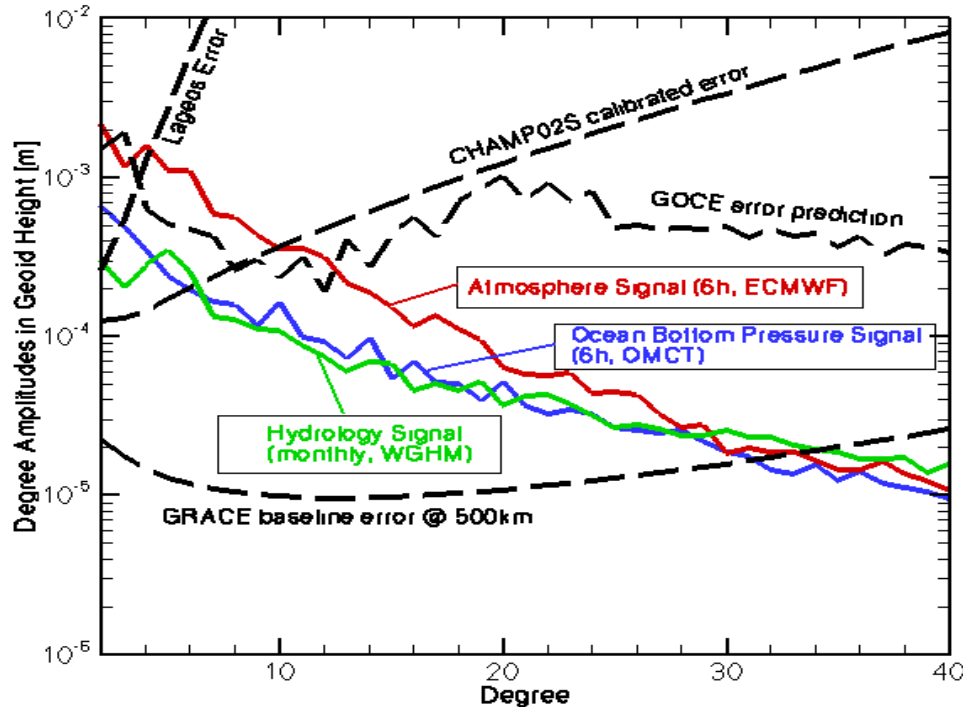
- Non-tidal atmosphere and ocean mass variations
- Non-tidal atmosphere loading

Non-tidal Mass Variations

- Atmosphere and Ocean Dealiasing Level-1B ReLease 2004 (AOD1B RL04) product from the GRACE Science Data System (SDS)
- Based on
 - 6h 0.5° European Center for Medium Weather Forecast (ECMWF) analysis data (2-3 d delay)
 - 6h 1.875° output from Ocean Model for Circulation and Tides (OMCT) forced by ECMWF
 - 1976 – 2000: based on the European ReAnalysis for 40 years (ERA40) and OMCT
- Content: 6h time series of spherical harmonics up to d/o 100 for 4 components:
 - Atmospheric variability
 - Oceanic variability
 - A/O combination
 - Ocean bottom pressure variability (OMCT + surface pressure)
- Product size:
 - ECMWF: 4 GB / month
 - AOD1B: 3 MB / month

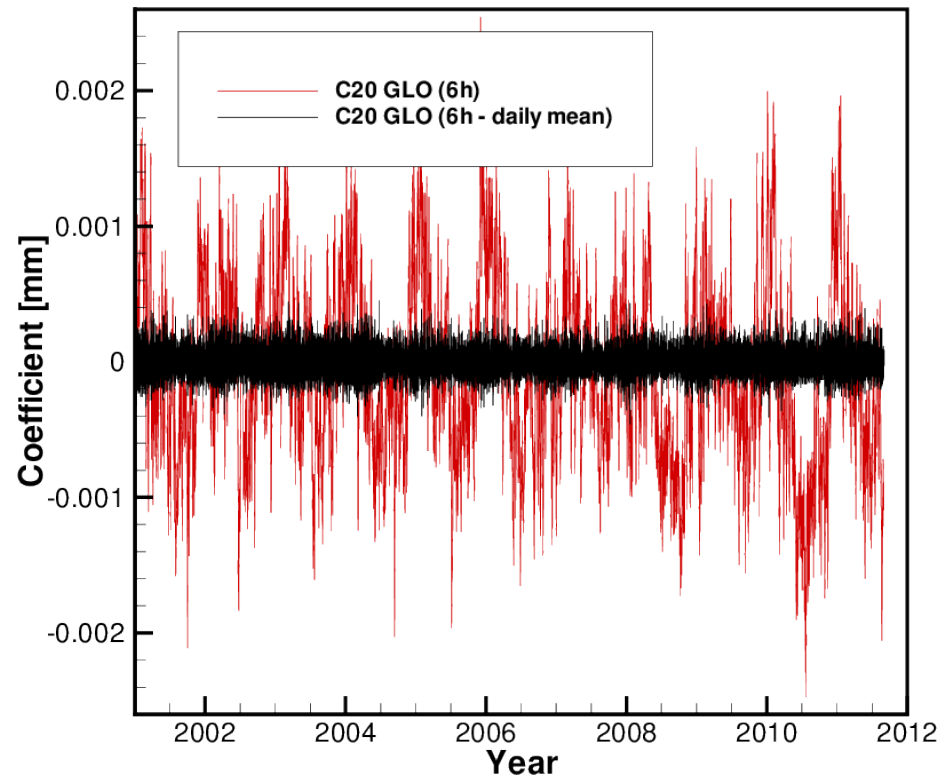
Time Variable Gravity

- GRACE is sensitive up to $d \approx 30$ for the atmospheric (ATM) and oceanic (OCE) variability
- LAGEOS is sensitive up to $d \approx 4$ for ATM+OCE



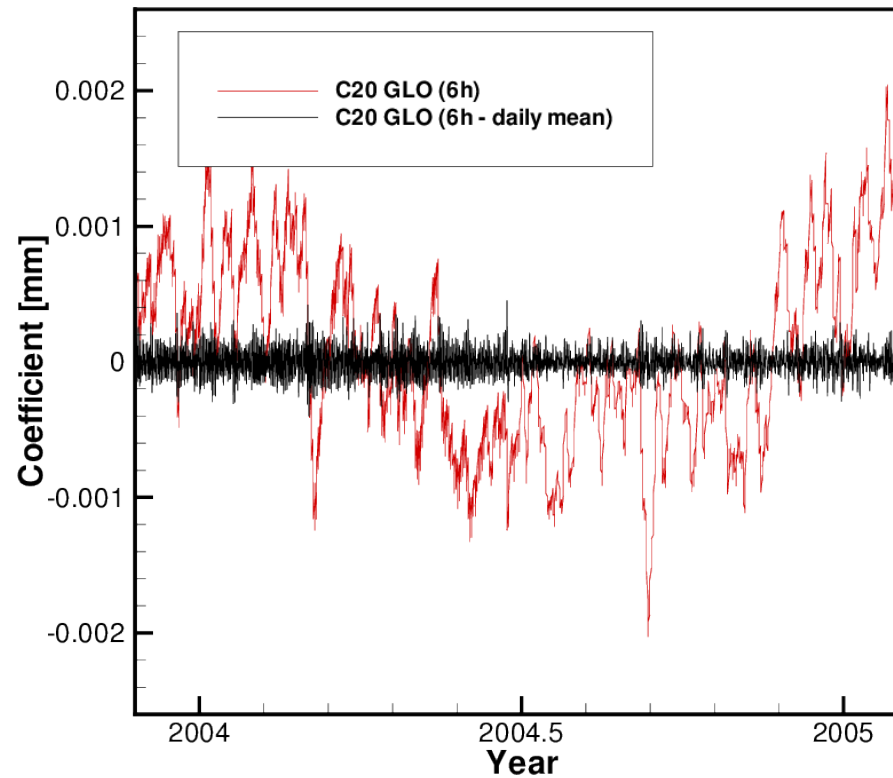
ATM+OCE Effect on C_{20}

- Gravity



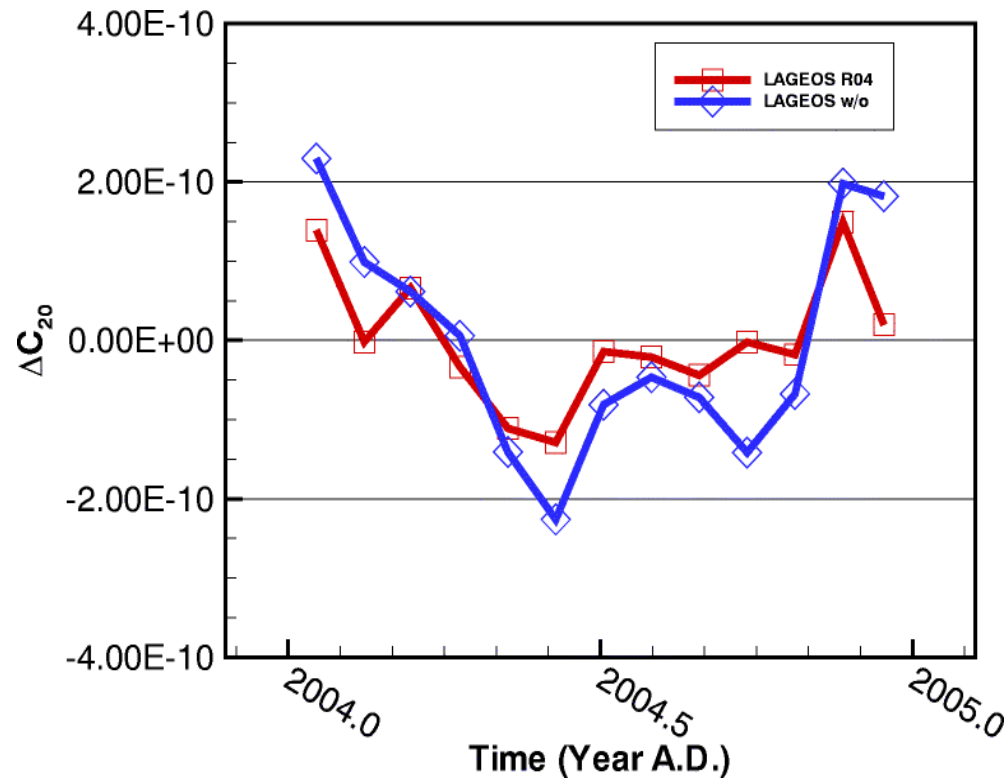
ATM+OCE Effect on C_{20}

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ATM+OCE Effect on C_{20}

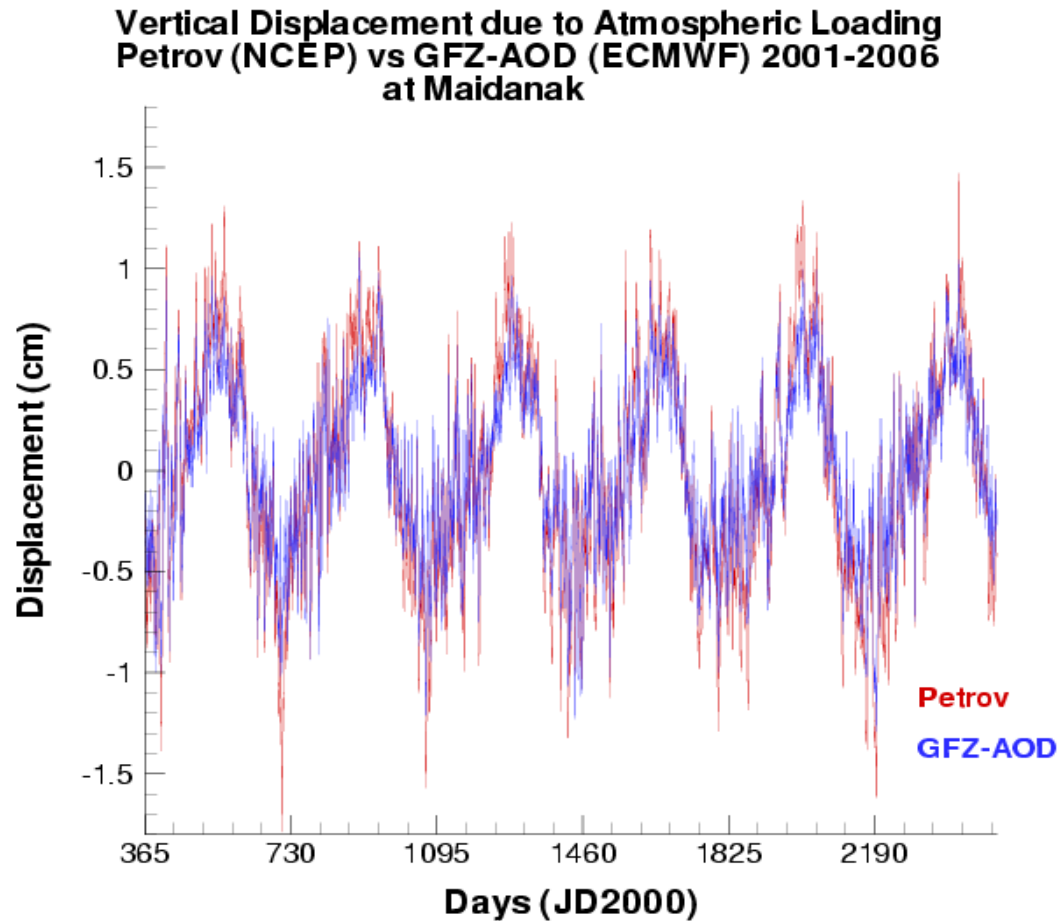
- LAGEOS monthly solutions



Non-tidal Atmospheric Loading

- Software originated from Groupe de Recherche de Geodesie Spatiale (GRGS) in 1997
- Theory: FARRELL, W.E., 1972
- Input:
 - Love numbers GEGOUT, 1997
 - ECMWF surface pressure data (same data base as for AOD1B processing, same mean: 2001+2002)
- Content:
 - Yearly files of station displacements for the radial, East and South direction at 6h increments
 - Station list comprises currently the ITRF2000 DOMES number list
 - -> no distinction between various occupations
- Size:
 - 16 MB per year

Non-tidal Atmospheric Loading



Summary

- AOD1B data and documentation available within the GRACE SDS from
 - isdc.gfz-potsdam.de
 - podaac.jpl.nasa.gov
- Non-tidal atmospheric loading data and file description should be made available at
 - isdc.gfz-potsdam.de