



Phasemeter development for future satellite-satellite ranging missions

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For future GRACE-type satellite gravity field missions a laser interferometer is a promising candidate to perform the length measurement between two satellites.

The primary measurement is a phase readout of a heterodyne beatnote in the MHz range. Similar to the phasemeter (PM) developed for the space based gravitational wave detector "Laser Interferometer Space Antenna" (LISA), a digital phase-locked loop is used to track the variable Dopplershift of the heterodyne frequency introduced by relative satellite movements. In comparison to the LISA-PM, a higher bandwidth (40 MHz instead of 20 MHz) is desirable, whereas the performance can be some what relaxed (\approx nm instead of \approx pm). We started to develop a phasemeter based on the current LISA design with a direct path to space qualification as one important design constraint.