



Optical Simulations of the Laser Ranging Instrument for the GRACE follow-on mission

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In the GRACE (Gravity Recovery and Climate Experiment) mission a microwave ranging system is used to measure the inter-satellite distance variations. In combination with high-low tracking (GPS) data and the satellites' attitude information, monthly solutions of the Earth's gravity field have been derived since 2002.

The GRACE follow-on mission, currently planned to be launched in 2017, will be equipped with an additional laser ranging instrument. This laser interferometer is capable of increasing the sensitivity of the distance measurements by an order of magnitude. Here we summarize results of the interferometer simulations, which confirm that attitude dependent polarization effects of mirrors do not disturb the length measurements. Furthermore we explain Differential-Wavefront-Sensing, which is used to obtain precise information on the satellites' pointing. We also present details on the acquisition for the laser interferometer.