



Ground simulator for a future satellite gravity mission by inter-satellite laser interferometer II

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Towards an extension of a precise Range and Range Rate measurement in a satellite-to-satellite (SST) tracking currently conducted by GRACE, a laser interferometric technique (SSI: satellite-to-satellite interferometry) has been developed to demonstrate a measurement with unprecedented precision by the ground simulator. The ground simulator is composed of a stabilized Nd:YAG laser, Mach-Zehnder type optical interferometer and controller / data retrieval system assuming the 450 km satellite altitude and 50 km inter-satellite range. The system simulates a part of the whole dynamic range of the Range and Range Rate data. Due to the wide dynamic range of doppler frequency change in the space, a part of the periodical change will be tested in the simulator. The results will be reported including optical delay insertion to one of interferometer arms and an optical beam tracking by a fast steering mirror under the simulated disturbances. Note that the other technologies, such as an accelerometer and an orbit determination software, are also under development in the feasibility study.