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Laser Ranging Interferometer on GRACE Follow-On: Current Status

Vitali Müller[1,2], Malte Misfeldt[1,2], Laura Müller[1,2], Henry Wegener[1,2], and Gerhard Heinzel[1,2]
[1]Max-Planck-Institute for Gravitational Physics, Hannover, Germany (vitali.mueller@aei.mpg.de)
[2]Institute for Gravitational Physics, Leibniz Universität Hannover, Germany

The GRACE Follow-On satellites were launched on 22nd May 2018 to continue the measurement of Earth's gravity field from the GRACE satellites (2002-2017). A few weeks later, an inter-satellite laser link was established with the novel Laser Ranging Interferometer (LRI), which offers an additional measurement of the inter-satellite range next to the one provided by the conventional microwave ranging instrument. The LRI is the first optical interferometer in space between orbiters, which has demonstrated to measure distance variations with a noise below 1 nm/√Hz at Fourier frequencies around 1 Hz, well below the requirement of 80 nm/√Hz. In this talk, we provide an overview on the LRI, present the current status of the instrument and show results regarding the characterization of the instrument. We will address impulse events that are apparent in the accelerometer and LRI range acceleration data, most of which are expected to be micro-meteorites. Other short-term disturbances in the ranging data will be addressed as well. We conclude with some learned lessons and potential modifications of the interferometry for future geodetic missions.