

Abstract Submitted
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Development and Analysis of Micro-cycle Phase Measurements for LISA DARSA DONELAN, SHAWN MITRYK, SYED REZA, JOSE SANJUAN, GUIDO MUELLER — The Laser Interferometer Space Antenna (LISA) project is a space-based gravitational wave (GW) interferometer designed to measure gravitational radiation in the frequency range from 0.1 mHz to 1 Hz. One-way laser phase measurements between the individual spacecraft in the LISA constellation are used to reconstruct an equal-arm interferometer, cancel the laser phase noise, and extract the gravitational wave information. The 2-20 MHz-frequency laser beat signals must be measured with a sensitivity of 1 ucycle/sqrt(Hz) in order to cancel the laser noise and accurately reconstruct the GW signal. The beat signal phase is measured with a phasemeter. In this presentation, the performance of our phasemeter and its limiting noise sources will be discussed. Methods of mitigating the phase noise, including the application of a post-processing calibration technique and active temperature stabilization, are considered and investigated for their applicability and usefulness to the LISA mission This work is supported by NASA grant NNX08AG75G.

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