Abstract Submitted
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Time-Delay Interferometry Simulations and Gravitational Wave Extraction at the University of Florida Interferometric Simulator[1] SHAWN MITRYK, University of Florida, VINZENZ WAND, EADS Astrium, ALIX PRESTON, GUIDO MUELLER, DAVID TANNER, University of Florida — The Laser Interferometer Space Antenna (LISA) is a NASA/ESA space mission with the goal of measuring gravitational waves (GW) at frequencies of 30 uHz - 1 Hz. Going to space avoids seimic and gravity-gradient noise which limit all ground-based detectors. LISA will measure the spatial changes between drag-free proof masses separated by a distance of 5 Gm using heterodyne interferometry. The laser noise must be recorded and removed from the measurement through time-delay interferometry (TDI) to extract gravitational wave signals. The University of Florida LISA Interferometry Simulator (UFLIS) performs hardware-in-the-loop simulations of LISA by reproducing the expected pre-stabilized laser noise, delaying the laser frequency noise by the light-travel time along the LISA arms, injecting mock gravitational wave signals, and forming the required TDI combinations to extract the injected GW signals. Using the UFLIS, we present the extraction of mock GW signals buried under 9 orders of magnitude of laser frequency noise.

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