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LISA Interferometer Test Bench at UF SRIDHAR REDDY GUNTAKA, RACHEL J CRUZ, J IRA THORPE, MICHAEL HARTMAN, DAVID B TANNER, GUIDO MUELLER, University of Florida — LISA, a joint NASA/ESA space mission to detect gravitational waves in the $10^{-4}$to 10^{-1}Hz frequency band, is scheduled to launch in 2015. LISA will consist of three spacecraft in a heliocentric orbit forming a triangle with a 5 Gm baseline. In order to detect gravitational waves, LISA will use laser interferometry to measure changes in spacecraft separations with pm accuracy. The interferometer signals will be dominated by laser frequency noise. The dominant laser frequency noise will be subtracted from the data stream by post-processing the data using time delay interferometry (TDI). This algorithm relies on a strong correlation between all LISA signals taken at different times and different spacecraft as well as on very low noise and large dynamic range phase meters and on accurate timing information. At the University of Florida, we are developing an experimental LISA simulator to test implementations of various aspects of LISA interferometry and TDI. Realistic light travel times between the spacecraft are simulated using an electronic phase delay technique. In this paper we will present preliminary results of an experimental implementation of TDI to test LISA-like signals in the laboratory. This work is supported by NASA grant BEFS04-0019-0019.

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