

LISA technology development at JPL

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The Laser Interferometer Space Antenna (LISA) project requires technological developments on many fronts. A physical understanding of the LISA subsystems is a precursor to tackling the requirements needed to ensure a successful mission. This can only be achieved by developing the concepts in the lab prior to developing the payload. This poster presents updates on laboratory activities intended to prove the feasibility of measuring proof mass back reaction forces of less than 3 fN; the sensing of the proof mass position within 2 nm/ $\sqrt{\text{Hz}}$ above 3 mHz; the stability of the positions of the optical components within 10 pm/ $\sqrt{\text{Hz}}$ above 3 mHz; the resolution and accuracy of the phase-meter to better than 10 pm/ $\sqrt{\text{Hz}}$ above 3 mHz; and the ability to measure laser beam pointing stability better than 1 nrad/ $\sqrt{\text{Hz}}$ above 3 mHz. The results show that we are well on our way to meeting LISA requirements in a laboratory environment.