

Abstract Submitted
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Detection of Micrometeoroids with LISA Pathfinder¹ IRA THORPE, NASA/GSFC, TYSON LITTENBERG, NASA/MSFC, DIEGO JANCHEZ, JOHN BAKER, NASA/GSFC, THE LISA PATHFINDER TEAM TEAM — The LISA Pathfinder mission (LPF), a joint ESA/NASA technology demonstration mission currently operating at the Sun-Earth L1 point, contains the most precise accelerometry system ever flown. Analysis suggests that LPF should have sufficient sensitivity to detect impacts of small micrometeoroids and dust through their transfer of momentum to the spacecraft. Moreover, LPF's ability to fully resolve both the linear and angular momentum transfer in three dimensions allows a magnitude, direction, and location to be estimated for each impact. We present preliminary results from a systematic search of the LISA Pathfinder data for such impacts and discuss the prospects for using these and future results to inform models of the formation and evolution of dust populations in the inner solar system. These models have wide applicability to both pure and applied space science, ranging from the physics of planet formation and dynamics of minor Solar System bodies to estimates of the micrometeorite hazard for future spacecraft.

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