

Abstract Submitted  
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**Hardware Development and Environmental Test Results for the TRL 5 LISA Charge Management Device**<sup>1</sup> BEN LETSON, SAMANTHA PARRY KENYON, MYLES CLARK, TAIWO OLATUNDE, SIMON BARKE, GUIDO MUELLER, PETER WASS, University of Florida, MARK STORM, Fibertek, JOHN W. CONKLIN, University of Florida — The LISA observatory, a space-based gravitational wave detector, consists of three drag-free spacecraft (SC) flying in an equilateral triangle formation. The SC motion is determined by their inertial reference sensors, which consist of a test mass (TM) in free fall at the level of  $\text{fm/s}^2/\text{Hz}^{1/2}$  in the mHz band, surrounded by an electrode housing (EH). Due to the charge build-up caused largely by cosmic rays, the LISA TMs will need to be discharged to minimize the effect of electrostatic forces on gravitational-wave observations. Contactless discharge can be performed using photoemission under illumination by ultraviolet light with a wavelength around 250 nm. One of NASA's technology contributions to this ESA led mission is the development of a Charge Management Device (CMD) responsible for maintaining a neutral TM potential with respect to its EH. The team at the University of Florida has recently developed a breadboard CMD to demonstrate technology readiness level 5. Validation of the unit will include over 1600 hours of thermal vacuum testing as well as shock and vibration testing of the full system. CMD environmental test results as well as the performance of the UV LEDs will be presented.

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