## Abstract Submitted for the SHOCK15 Meeting of The American Physical Society

Spin-Separated Spherical Low-Range Hypervelocity Impact Response of Carbon-Fiber/Metallic-Glass Fiber Metal Laminate Composite RENE DIAZ, NIKHIL SHUKLA, CHRISTOPHER LO, Georgia Institute of Technology, LEE HAMILL, University of Southern California, Los Angeles, SCOTT ROBERTS, Jet Propulsion Laboratory, California Institute of Technology, MARC DAVIDSON, STEVEN NUTT, University of Southern California, Los Angeles, GREG KENNEDY, Georgia Institute of Technology, DOUGLAS HOFMANN, Jet Propulsion Laboratory, California Institute of Technology, NARESH THADHANI, Georgia Institute of Technology — In this work, ballistic impact tests were conducted to compare the performance of Whipple shields consisting of metallic glass fiber-metal laminates (FML) with a baseline comparison of the shields currently utilized by the International Space Station. The threat of micro-meteoroid and orbital debris (MMOD) collisions with spacecraft and satellites has been escalating with the increasing worldwide use of low earth orbit spacecraft. Fiber metal laminates (FML) consist of alternating layers of metal and fiber reinforced polymer composite. Our study investigates the use of bulk metallic glass (BMG) sheets with carbon-fiber reinforced epoxy. The hybrid FML design gains structural rigidity from the carbon fiber composite and impact resistance from the metallic glass. Utilizing a single-stage, light gas gun, 3 mm spherical projectiles mounted a serrated, segmented sabot made of glass-filled polycarbonate is accelerated and spin-separated through a rifled barrel and sabot stripper impact velocities of  $0.7-1.5 \text{ km} \cdot \text{s}^{-1}$ . The design of the impact set-up and the characteristics of the metallic-glass based shield. along with results obtained to date will be presented.

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