Abstract Submitted
for the SHOCK09 Meeting of
The American Physical Society

The Laser-driven Flyer System for Space Debris Hypervelocity Impact Simulations ZIZHENG GONG, FU DAI, JIYUN YANG, MINGQIANG HOU, JIANDONG ZHENG, JINGYU TONG, Beijing Institute of Spacecrafts Environment Engineering, HEWEI PANG, China Academy of Space Technology — The Laser-driven flyer (LDF) technique is showing promiseful in simulating micro meteoroids and orbital debris (M/OD) hypervelocity impacting effects. LDF system with a single pulses from a Q-switched Nd: glass laser, of 15 ns duration and up to 20J energy, launched the aluminum films of 5 μm thickness up to 8.3km/s velocity was developed in *Beijing Institute of Spacecrafts Environment Engineering(BISEE), CAST.* The quantitative relationships between the flyer velocity and the laser energy, the width of laser pulse, the diameter of laser focal spot, and the flyer thickness were analyzed, according to Lawrence-Gurney model, and compared with the experimental results. Some experimental aspects in our efforts on the space debris Hypervelocity impacts on the outer surfaces functional material, such as the thermal control material, window glass, and OSR etc., are reviewed. Though still developing, the Laser-driven flyer technique has been demonstrated promise in simulating micro M/OD hypervelocity impacting effects.

Zizheng Gong
Beijing Institute of Spacecrafts Environment Engineering

Date submitted: 24 Feb 2009 Electronic form version 1.4