

Abstract Submitted  
for the SHOCK19 Meeting of  
The American Physical Society

**Ultrahigh-pressure Hugoniot equations of state up to TPa based on three-stage gas gun**<sup>1</sup> JIANBO HU, XIANG WANG, CHENGDA DAI, QIANG WU, Laboratory for Shock Wave and Detonation Physics, Institute of Fluid Physics, China Academy of Engineering Physics, LABORATORY FOR SHOCK WAVE AND DETONATION PHYSICS TEAM — A three-stage gas gun, composed of a two-stage gas gun and the add-on part, has been developed to launch high-Z flyer plates up to 10 km/s for ultrahigh-pressure Hugoniot measurements. Great care was taken to optimize the add-on part to satisfy the requirements for high-precision Hugoniot measurements. With such a hypervelocity launcher technique, we measured Hugoniot equations of state (EOS) of metals of interest up to TPa. Results show that Hugoniot EOS of Ta, Mo, and Pt remain linear while those of Au, Bi, and Fe exhibit certain nonlinearity. The underlying physics of the observed nonlinear behavior has been qualitatively discussed.

<sup>1</sup>This work was supported by Science Challenge Project (No. TZ2018001) and China 1000-Young Talents Plan.

Jianbo Hu  
China Academy of Engineering Physics

Date submitted: 25 Feb 2019

Electronic form version 1.4