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**Techniques for measuring ultrahigh-pressure Hugoniot equation of state on a three-stage gas gun** XIANG WANG, JIANBO HU, CHENGDA DAI, QIANGSONG WANG, JINGSONG BO, HUA TAN, YUYING YU, Institute of Fluid Physics, CAEP — A three-stage gas gun was developed by mounting an extending launcher tube on a two-stage gas gun, and was successfully applied to perform ultrahigh-pressure Hugoniot measurements for Ta and Pt by using this three-stage gun. Here we introduced the three-stage gas gun launcher and Hugoniot measurement techniques, including shock front shape diagnosis, shock wave velocity and impact velocity measurement as well as numerical simulation. By using this three-stage gun, Ta or Pt impactors were launched up to  $\sim 10$  km/s, and the Hugoniot data were respectively measured with high accuracy up to 750 GPa for Ta and 1TPa for Pt. It is demonstrated that the three-stage gas gun is a promising technique for studying the ultrahigh-pressure properties of materials, which never before obtained by utilizing two-stage light-gas-gun.

Xiang Wang  
Institute of Fluid Physics, CAEP

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