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Application of Electric Gun for Shock Induced Phase Transition Experiments in Iron¹ TAO LI, National Key Laboratory of Shock Wave and Detonation Physics, Institute of Fluid Physics, CAEP, WENJUN ZHU, HONG CHEN, QIANG LI — Electric gun can be applied in experiments for shock induced phase. The thickness of sample is comparable to the grain size of real matter. In this paper, the propagation of small distance in iron sample of about 1mm thickness is investigated to distinguish wave structure evolution of the shock induced phase transition. In the experiment, an aluminum foil is discharged into plasma to drive a 0.25mm thickness Mylar flyer through a 10mm diameter gun barrel, and the Mylar flyer is then accelerated to impact a 1mm thickness iron sample. The signal of the free-surface of the iron sample is captured by a high precision DPS interferometer. The obtained three-wave structure velocity profile in nanosecond time-scale clearly provides evidence of shock induced phase transition in the thin iron sample.

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