Title
Experiments in warm dense matter using an ion beam driver

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PAC07 Abstract

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Abstract We describe near term heavy-ion beam-driven warm dense matter (WDM) experiments. Initial experiments are at low beam velocity, below the Bragg peak, increasing toward the Bragg peak in subsequent versions of the accelerator. The WDM conditions are envisioned to be achieved by combined longitudinal and transverse neutralized drift compression to provide a hot spot on the target with a beam spot size of about 1 mm, and pulse length about 1-2 ns. The range of the beams in solid matter targets is about 1 micron, which can be lengthened by using porous targets at reduced density. Initial candidate experiments include an experiment to study transient darkening in the WDM regime; and a thin target dE/dx experiment to study beam energy and charge state distribution in a heated target. Further experiments will explore target temperature and other properties such as electrical conductivity to investigate phase transitions and the critical point.

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Footnote

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