

Abstract Submitted  
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**High Energy Density Physics Research Using Intense Ion Beams:  
the HEDgeHOB Collaboration** N.A. TAHIR, GSI Darmstadt, A. SHUTOV, I.V.  
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HOFFMANN, TU Darmstadt, C. DEUTSCH, LPGP Orsay — Intense particle  
beams provide a novel tool to generate large samples of HED matter with uni-  
form physical conditions [1]. Theoretical studies have shown that an ion beam can  
be employed using different experimental schemes to study HED states in matter.  
These include **HIHEX** [2,3] and **LAPLAS** [4,5]. The former involves isochoric and  
uniform heating of matter by an ion beam that is followed by isentropic expansion  
of the heated material. This allows one to access the entire phase diagram including  
those regions which can not be accessed by traditional methods of shock waves. The  
latter considers a multiple shock reflection technique that leads to a low-entropy  
compression of a test material like H or water which generates physical conditions  
that are expected to exist in the interior of giant planets. Interesting problems like  
Rayleigh-Taylor and Richtmyer-Meshkov instabilities have also been investigated in  
detail. This work has provided the necessary basis for the **HEDgeHOB** proposal for  
future experiments at the **FAIR** facility at Darmstadt. [1] N.A. Tahir et al., PRE  
60 (1999) 4715. [2] D.H.H. Hoffmann et al., PoP 9 (2002) 3652. [3] N.A. Tahir et  
al., PRL 95 (2005) 035001. [4] N.A. Tahir et al., PRE 62 (2001) 016402. [5] N.A.  
Tahir et al., Nucl. Instr. Meth. A 577 (2007) 238.

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