

Abstract Submitted  
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**Precompressed Hugoniots of Hydrogen-Helium Mixtures from Density Functional Theory**<sup>1</sup> RAYMOND CLAY, Sandia National Laboratories — Understanding the behavior in hydrogen helium mixtures at extreme conditions is critically important to constructing quantitative models of Jovian planet evolution. In particular, the presence of an immiscibility transition in the atmosphere of Saturn is required to explain its unusually high luminosity compared to Jupiter. As multiple experimental platforms are working towards observing this transition in the lab, it is important to cross validate experimental results ab initio calculations at temperature and pressure conditions leading up to this transition. To this end, we present in this work several precompressed Hugoniots of hydrogen-helium mixtures calculated within density functional theory based molecular dynamics, over thermodynamic regimes of relevance for upcoming ramp compression style experiments.

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