Abstract Submitted
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Energy Dissipation at a Shock Front in Diamond: Simulation and Comparison with Phase Contrast Imaging Data[1] MARTHA BECKWITH, Lawrence Livermore Natl Lab, ANDREAS SCHROPP, Technische Universitat Dresden, YUAN PING, DAMIAN SWIFT, GILBERT COLLINS, Lawrence Livermore Natl Lab — Understanding the behavior of carbon at high pressures and temperatures is essential for predicting the structure and evolution of giant planets, such as Uranus and Neptune. Shock compression experiments on pure carbon materials, such as diamond, can provide insight into their behavior at the extreme temperatures and pressures of the giant planets. Phase contrast imaging and hydrodynamic simulations were used to examine the propagation of a shock front in diamond. As the shock front propagates through the sample, a decrease in the shock amplitude and an increase in the shock width are observed, indicating that energy dissipative processes, such as viscosity, are apparent. In addition, fractures are observed in the diamond sample behind the shock, which could also contribute to the energy dissipation at the shock front.

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Martha Beckwith
Lawrence Livermore Natl Lab

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