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Three Dimensional Hybrid Simulations of Super-Alfvénic Laser Ablation Experiments in the Large Plasma Device STEPHEN CLARK, Univ of California - Los Angeles, DAN WINSKE, Los Alamos National Laboratory, DEREK SCHAEFFER, ERIK EVERSON, ANTON BONDARENKO, CARMEN CONSTANTIN, CHRISTOPH NIEMANN, Univ of California - Los Angeles — We present 3D hybrid simulations of laser produced expanding debris clouds propagating though a magnetized ambient plasma in the context of magnetized collisionless shocks. New results from the 3D code are compared to previously obtained simulation results using a 2D hybrid code. The 3D code is an extension of a previously developed 2D code developed at Los Alamos National Laboratory. It has been parallelized and ported to execute on a cluster environment. The new simulations are used to verify scaling relationships, such as shock onset time and coupling parameter (R_m/ρ_d), developed via 2D simulations. Previous 2D results focus primarily on laboratory shock formation relevant to experiments being performed on the Large Plasma Device, where the shock propagates across the magnetic field. The new 3D simulations show wave structure and dynamics oblique to the magnetic field that introduce new physics to be considered in future experiments.

Stephen Clark
Univ of California - Los Angeles

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