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Studying Electromagnetic Beam Instabilities in Laser Plasmas for Alfvenic Parallel Shock Formation R. S. DORST, P. V. HEUER, M. S. WEIDL, Univ of California - Los Angeles, D. B. SCHAEFFER, Princeton University, C. G. CONSTANTIN, S. VINCENA, S. TRIPATHI, W. GEKELMAN, Univ of California - Los Angeles, D. WINSKE, Lawrence Livermore National Laboratory, C. NIEMANN, Univ of California - Los Angeles — We present measurements of the collisionless interaction between an exploding laser-produced plasma (LPP) and a large, magnetized ambient plasma. The LPP is created by focusing a high energy laser on a target embedded in the ambient Large Plasma Device (LAPD) plasma at the University of California, Los Angeles. The resulting super-Alfvenic (MA = 5) ablated material moves parallel to the background magnetic field (300 G) through 12m (80 i) of the LAPD, interacting with the ambient Helium plasma (ni = 91012 cm3) through electromagnetic beam instabilities. The debris is characterized by Langmuir probes and a time-resolved fluorescence monochromator. Waves in the magnetic field produced by the instabilities are diagnosed by an array of 3-axis bdot magnetic field probes. Measurements are compared to hybrid simulations of both the experiment and of parallel shocks.

Robert Dorst
Univ of California - Los Angeles

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