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Comparison of Laboratory and 2D Hybrid Simulations of Laser-Driven Magnetic Pistons Relevant to Magnetized Collisionless Shocks E.T. EVERSON, D.B. SCHAEFFER, UCLA, D. WINSKE, LANL, M. LAUTER, G. RENNENKAMPFF, University of the German Armed Forces, Munich, S.E. CLARK, A.S. BONDARENKO, C.G. CONSTANTIN, C. NIEMANN, UCLA — Experiments performed at the University of California at Los Angeles (UCLA) utilized the Large Plasma Device (LAPD) and the Phoenix Laser to drive sub- and super-Alfvénic laser-plasma explosions through the uniform, magnetized background plasma of the LAPD. The 30 J, 5 ns FWHM Phoenix laser ablated a graphite target to produce a debris-plasma that is allowed to expand (> 50 cm) across and shock the low-density ($1 - 5 \times 10^{12}$ cm^{-3}), magnetized ($275 - 600$ G) Helium (or Hydrogen) plasma of the LAPD. Magnetic flux probe measurements of the cross field expansion are compared to 2D hybrid simulations to provide insight on the decoupling between the fast debris-ions and diamagnetic bubble, the coupling between the slower debris-ions and ambient-ions, and the magnetic piston.

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