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Three-dimensional RAGE Simulations of Strong Shocks Interacting with Sapphire Balls B.H. WILDE, R.F. COKER, LANL, P.A. ROSEN, J.M. FOSTER, AWE, P. HARTIGAN, R. CARVER, Rice, B.E. BLUE, GA, J.F. HANSEN, LLNL — The goal of our 2007-2008 NLUF experiments at the OMEGA laser facility is to investigate the physics associated with the interaction of strong shocks and jets with clumpy media. These experiments have close analogs with structures observed in a variety of astrophysical flows, including jets from young stars, outflows from planetary nebulae, and extragalactic jets. In these experiments, a multi-mega bar shock is created in a plastic layer by heating a hohlraum to 190 eV temperature with 5 kJ of laser energy. The shock enters a 0.3 g/cc RF foam into which are embedded 500 micron diameter sapphire balls. The shock shears off the ball such that it creates thin two-dimensional sheets of sapphire which subsequently break up and undergo the three-dimensional Widnall instability (Widnall, S. E., Bliss, D. B., & Tsai, C. 1974, J. Fluid Mech., 66, 35). The time evolution of the ball/balls is diagnosed with dual-axes point-projection radiography. In this poster, we discuss the results of high-resolution three-dimensional radiation-hydrodynamic simulations with the adaptive-mesh-refinement RAGE code of single and multiple balls. Comparisons with data from our August shots will be made.

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