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Modeling of Supersonic Jet Experiments Performed on the Sandia National Laboratory Z Accelerator B.H. WILDE, R.F. COKER, LANL, G.R. BENNETT, D.B. SINARS, SNL, P.A. ROSEN, J.M. FOSTER, AWE, T.S. PERRY, LLNL — As a follow on to the previous talk, we present the results of two-dimensional simulations for the supersonic jet experiments performed on the Sandia National Laboratory Z Accelerator. Since the jet is effectively driven by the gold hohlraum surrounding the Z tungsten wire array, the calculations are driven with the measured temperature profile obtained with a transmission grating spectrometer and an imaging x-ray silicon diode array. In addition to the peak temperature of $\sim$140 eV with a full-width half maximum of 20 ns, the ablatively-driven pin also sees $\sim$100 ns of a low temperature foot generated during the collapse of the wire array onto the symmetry axis. We have used the continuous-adaptive-mesh-refinement radiation-hydrodynamics code RAGE to design and analyze these experiments. Although the agreement of the jet evolution with the data is good, the material following the jet is not matched as well. This may be due to the limitation of using radiation-diffusion instead of transport for the simulations and a lack of a complete understanding of the asymmetries introduced during the pinch implosion.

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