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Mesoscale Simulation of Shocked PMP Foams T.A. HAILL, T.R. MATTSSON, S. ROOT, D.G. SCHROEN, D.G. FLICKER, Sandia National Laboratories — Hydrocarbon foams are commonly used in HEDP experiments, and are subject to shock compression from tens to hundreds of GPa. Modeling foams is challenging due to the heterogeneous character of the foam. A quantitative understanding of foams under strong dynamic compression is sought. We use Sandia's ALEGRA-MHD code to simulate 3D mesoscale models of pure poly(4-methyl-1-petene) (PMP) foams. We employ two models of the initial polymer-void structure of the foam and analyze the statistical properties of the initial and shocked states. We compare the simulations to multi-Mbar shock experiments at various initial foam densities and flyer impact velocities. Scatter in the experimental data may be a consequence of the initial foam inhomogeneity. We compare the statistical properties the simulations with the scatter in the experimental data.

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