Modeling the LANL Triple Point Overdrive Experiment in the FLAG Hydrocode ADAM COLEMAN, CARL JOHNSON, MATT BISS, Los Alamos National Laboratory — A series of multi-point initiation (MPI) experiments investigating overdriven states in pentaerythritol tetranitrate (PETN) are currently underway at Los Alamos National Laboratory (LANL). These experiments make use of a three-initiator charge design that produces spherically diverging detonation waves that converge on axis producing a transient overdriven state in a PETN-acceptor charge. Acceptor thickness was varied (2.5 – 10 mm) in a cutback series. Three-dimensional simulations were conducted using LANL's FLAG hydrocode in support of the MPI experiments. Simulations made use of the LANL developed MARS artificial viscosity and the AWSD reactive burn model. Results of the simulations were compared with experimental diagnostics (steak camera and photonic Doppler velocimetry). Detonation velocity as a function of acceptor thickness was calculated from the shock x-t profile and are compared with experimental calculations. The overdriven pressure profile in the acceptor charge was modeled to obtain a decay constant characterizing the relaxation to steady detonation behavior. The results of a mesh resolution study and the limitations of our current simulation are presented. Finally, scoping calculations of new experimental designs for future experiments at LANL are discussed.

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