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Suppression of the spherically converging magnetohydrodynamic Richtmyer-Meshkov instablity in an octahedrally symmetric seed magnetic field[1] WOUTER MOSTERT, Graduate Aerospace Laboratories, California Institute of Technology, VINCENT WHEATLEY, School of Mechanical and Mining Engineering, University of Queensland, DALE PULLIN, Graduate Aerospace Laboratories, California Institute of Technology, RAVI SAMTANEY, Mechanical Engineering, King Abdullah University of Science and Technology — We present results of ideal magnetohydrodynamics simulations investigating the Richtmyer-Meshkov instability in near-spherical implosions in the presence of an octahedrally symmetric seed magnetic field. The problem is motivated by the desire to maintain a symmetrical collapse of the primary shock wave, minimally distorted by the effect of the seed magnetic field, while retaining the seed-field-induced suppression of the Richtmyer-Meshkov instability. The field is generated by a set of six current loops arranged around the target as on the faces of a cube. The instability is generated on a perturbed spherical density interface that is accelerated from the outside by imploding magnetohydrodynamic shocks, which are in turn generated by a spherical Riemann problem. The perturbation on the density interface is formed with a single-dominant-mode spherical harmonics expansion. We investigate the evolution of the interface and the transport of baroclinic vorticity near the interface, and examine the extent of the distortion to the primary magnetohydrodynamic shock system induced by the seed field.

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