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Comparing the Richtmyer-Meshkov instability of thermal and ion-species interfaces in two-fluid plasmas[1] VINCENT WHEATLEY, DARYL BOND, The University of Queensland, YUAN LI, RAVI SAMTANEY, King Abdullah University of Science and Technology, DALE PULLIN, California Institute of Technology — The Richtmyer-Meshkov instability (RMI) of a shock accelerated perturbed density interface is important in both inertial confinement fusion and astrophysics, where the materials involved are typically in the plasma state. Initial density interfaces can be due to either temperature or ion-species discontinuities. If the Atwood number of the interfaces and specific heat ratios of the fluids are matched, these two cases behave similarly when modeled using the equations of either hydrodynamics or magnetohydrodynamics. In the two-fluid ion-electron plasma model, however, there is a significant difference between them: In the thermal interface case, there is a discontinuity in electron density that is also subject to the RMI, while for the ion-species interface case there is not. It will be shown via ideal two-fluid plasma simulations that this causes substantial differences in the dynamics of the flow between the two cases.

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