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Circulation in blast driven instabilities MARC HENRY DE FRAHAN, ERIC JOHNSEN, Univ of Michigan - Ann Arbor — Mixing in many natural phenomena (e.g. supernova collapse) and engineering applications (e.g. inertial confinement fusion) is often initiated through hydrodynamic instabilities. Explosions in these systems give rise to blast waves which can interact with perturbations at interfaces between different fluids. Blast waves are formed by a shock followed by a rarefaction. This wave profile leads to complex time histories of interface acceleration. In addition to the instabilities induced by the acceleration field, the rarefaction from the blast wave decompresses the material at the interface, further increasing the perturbation growth. After the passage of the wave, circulation circulation generated by the blast wave through baroclinic vorticity continues to act upon the interface. In this talk, we provide scaling laws for the circulation and amplitude growth induced by the blast wave. Numerical simulations of the multifluid Euler equations solved using a high-order accurate Discontinuous Galerkin method are used to validate the theoretical results.

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