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Vortex sheet dynamics with bulk point vortices in Richtmyer-Meshkov instability[1] CHIHIRO MATSUOKA, Osaka City University — Nonlinear interaction between bulk point vortices and the interface in the incompressible Richtmyer-Meshkov instability (RMI) is investigated theoretically and numerically. It is reported that when the vorticity of bulk vortices is small, the interface in RMI is stabilized by the existence of bulk vortices at least in the linear stage [Cobos-Campos and Wouchuk, PRE 93, 053111 (2016)]. In real physical systems, multi-shocks propagates through a multi-layer target for high-density fuel compression in ICF. When a shock wave crosses interfaces, RMI and reflected shocks or rarefaction waves occur at the interfaces. Defects in a target also cause the generation of point-like vortices in bulk when shocks pass through. The vorticity or strength of these defect-induced bulk vortices is not necessarily weak, and they can lead the system to a turbulent state by interacting the interface. Therefore, it is important to know the behavior of the interface or the vortex sheet coexisting with bulk vortices. In the present work, we present a mathematical model to describe the nonlinear interaction between bulk vortices and an interface and report the complicated interfacial shape and the loci of bulk point vortices numerically.

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Chihiro Matsuoka
Osaka City University

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