Abstract:

Vortex sheets are idealized models for flows undergoing intense shear in a thin region. They are an ubiquitous phenomena in incompressible fluid dynamics. Mathematically, two-dimensional vortex sheets correspond to solutions of the incompressible 2D Euler equations with locally square-integrable velocity and whose vorticity is a bounded Radon measure. Existence of weak solutions with this regularity has been established when the singular part of vorticity has a distinguished sign, however there is very little qualitative information about these solutions. In this talk we examine the interaction between vortex sheets and a material boundary, namely the boundary of the fluid domain. We discuss the behavior of circulation, net force and torque across this material boundary, for vortex sheet flows.