

Dynamics of concentrated vorticities in 2d and 3d Euler flows

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A classical problem that traces back to Helmholtz and Kirchhoff is the understanding of the dynamics of solutions to the Euler equations of an inviscid incompressible fluid when the vorticity of the solution is initially concentrated near isolated points in 2d or vortex lines in 3d. We discuss some recent results on these solutions' existence and asymptotic behavior. We describe, with precise asymptotics, interacting vortices, and traveling helices, and extension of these results for the 2d generalized SQG. This is research in collaboration with J. Dávila, A. Fernández, M. Musso, S. Parmeshwar, and J. Wei.