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Gluing methods for vortex dynamics in Euler flows

A classical problem for the two-dimensional Euler flow for an incompressible fluid confined to a smooth domain. is that of finding regular solutions with highly concentrated vorticities around N moving *vortices*. The formal dynamic law for such objects was first derived in the 19th century by Kirkhoff and Routh. We devise a gluing approach for the construction of smooth N-vortex solutions. We capture in high precision the core of each vortex as a scaled finite mass solution of Liouville's equation plus small, more regular terms.

This work is in collaboration with J. Dávila, M. del Pino, J. Wei.