Colloquium ICMAT-UCM

GLUING METHODS FOR VORTEX DYNAMICS IN EULER FLOWS

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ABSTRACT: We consider the two-dimensional Euler flow for an incompressible fluid confined to a smooth domain. We construct smooth solutions with concentrated vorticities around points which evolve according to the Hamiltonian system for the Kirkhoff-Routh energy. The profile around each point resembles a scaled finite mass solution of Liouville’s equation. We discuss extensions of this analysis to the case of vortex filaments in 3-dimensional space, along the lines of Da Rios 1904 vortex filament conjecture in connection with the binormal flow of curves.