Viscous evolution of 2D dipolar vortices

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Numerical simulations with a finite-difference method have revealed that a Lamb dipole when placed in a viscous fluid moves along a straight line with decreasing velocity and increasing radius. The relationship between vorticity and streamfunction, which initially is linear, becomes more and more sinh-like as the dipole decays. Some other initial dipolar vorticity distributions (like two oppositely signed monopolar vortices) were found to evolve to a dipolar structure with Lamb-like characteristics.

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