Vortex Motion and Soliton

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The original observation of vortex soliton in a rotating tank experiment was done ten years after Hasimoto presented the transformation between the Local Induction Equation and the cubic nonlinear Schrödinger equation. The observation pointed out that a soliton transports physical quantities, such as mass, kinetic energy, and linear and angular momenta from a turbulent region to a laminar one. In this talk we will numerically demonstrate that a vortex soliton transport mass by trapping fluid particles around its kink part. To explain the particle trapping, a simple 3D ODE system (chopsticks model) is presented and investigated.