

VORTEX SYMMETRIZATION PROBLEM FOR THE 2D EULER EQUATION

HAO JIA

The 2d incompressible Euler equation is globally well posed for smooth initial data. However the long term dynamics of general solutions is difficult to understand due to the lack of global relaxation mechanisms. Numerical simulations and physical experiments show that vortices (steady solutions with radial vorticity functions) play an important role in the global dynamics, through a process called vortex symmetrization of small perturbations. In this talk, I will discuss some recent progress on this problem, including a full nonlinear symmetrization result near a special point vortex and precise linearized symmetrization result near general vortices. Difficulties of full nonlinear vortex symmetrization around general vortices will also be discussed. Joint work with Alexandru Ionescu.