Dynamics of concentrated vorticities in 2d and 3d Euler flows

Manuel del Pino[1]

[1] University of Bath

A classical problem that traces back to Helmholtz and Kirchoff is the understanding of the dynamics of solutions to the 2d and 3d Euler equations of an inviscid incompressible fluid, when the vorticity of the solution is initially concentrated near isolated points in 2d or vortex lines in 3d. We discuss some recent result on existence and asymptotic behaviour of these solutions. We describe, with precise asymptotics, interacting vortices and travelling helices. We rigorously establish the law of of motion of of "leapfrogging vortex rings", originally conjectured by Helmholtz in 1858. This is joint work with Juan Davila, Monica Musso and Juncheng Wei.