

Global bifurcation of rotating vortex patches

Miles Wheeler, Courant Institute of Mathematical Sciences

Vortex patch solutions of the two-dimensional Euler equations that rotate with constant angular velocity have been rigorously constructed as perturbations of the disk. For each $m \geq 3$, there is a small curve of solutions which have the symmetry of a regular m -gon. In this talk we prove that these local bifurcation curves can be extended to global ones. Near the end of each global curve, the minimum value on the boundary of the patch of the angular fluid velocity becomes arbitrarily small. This is consistent with the formation of sharp corners which is observed numerically.