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Eigenvalues associated with the vortex patch in 2-D Euler equations. (English) Zbl 1058.76012
Math. Ann. 330, No. 4, 747-758 (2004).

Summary: We consider Dirichlet eigenvalue problem associated with a vortex patch for two-dimensional Euler equations. We show that the eigenvalues grow at most doubly exponentially in time. As an application, we derive bounds on the growth of some geometric quantities like the diameter and the inscription radius of the patch. We also discuss the growth of the perimeter of the patch. In particular, we give a double exponential bound on the growth of certain portion of the boundary of the patch.

MSC:

76B03 Existence, uniqueness, and regularity theory for incompressible inviscid fluids Cited in 5 Documents
76B47 Vortex flows for incompressible inviscid fluids
35Q35 PDEs in connection with fluid mechanics

Keywords:

double exponential growth bound

Full Text: [DOI](#)

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