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Elizabeth Thoren* (ethoren@math.ucsb.edu), Department of Mathematics, South Hall Rm 6607, University of California, Santa Barbara, CA 93106. *Linear Instability for Incompressible Inviscid Fluid Flows: Two Classes of Perturbations*. Preliminary report.

One approach to examining the stability of a fluid flow is to linearize the evolution equation at an equilibrium and determine (if possible) the stability of the resulting linear evolution equation. In this talk I will split the space of perturbations of an equilibrium flow into two classes and analyze the growth of the linear evolution operator acting on each class. This classification of perturbations is most naturally described in V.I. Arnold's geometric view of fluid dynamics. The first class of perturbations I will examine are those that preserve the topology of vortex lines and the second class is the factor space corresponding to the first class. I will establish lower bounds for the essential spectral radius of the linear evolution operator restricted to each class of perturbations, which leads to linear instability criteria for equilibrium flows subject to perturbations from each class. (Received September 08, 2009)