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Variational problem in a partially ordered set and the problems of fluid dynamics

We consider 2-dimensional flows of ideal incompressible fluid, i.e., vector fields in a 2-d domain which are divergence-free and tangent to the boundary. The flows have an intrinsic partial order. Minimal elements of this order are stationary and stable solutions of the Euler equations. This is a non-classical variational principle which may be regarded as dual to the Arnold variational principle for stationary flows, while having very different meaning.

The talk is devoted to the connections of this principle and the problem of the long time asymptotics of solutions of the Euler equations, and the numerical solution of this nonclassical variational problem.