

1167-35-104

Thomas C Sideris* (sideris@ucsb.edu), **Steve Shkoller** and **Jay Roberts**. *The affine motion of 2d incompressible ideal fluids surrounded by vacuum.*

The equations of affine motion for a 2D incompressible ideal fluid surrounded by vacuum reduce to a globally solvable Hamiltonian system of ordinary differential equations for the deformation gradient constrained to $SL(2)$. The evolution of the fluid domain is described by a family ellipses of fixed area. We shall provide a complete description of the dynamic behavior of these domains for perfect fluids and for magnetically conducting fluids. For perfect fluids, the displacement generically becomes unbounded as $t \rightarrow \pm\infty$, and for magnetically conducting fluids, solutions remain bounded and are generically quasi-periodic. (Received February 24, 2021)