

1040-76-12

Roman Shvydkoy* (shvydkoy@math.uic.edu), 851 S Morgan St, M/C 249, Chicago, IL 60607.

Energy of singular solutions to the Euler equations. Preliminary report.

Regular solutions to the Euler equations conserve energy. For weak solutions this classical law may fail. According to Onsager the minimal regularity required for a weak solution to still conserve energy is Holder $1/3+\epsilon$. Under additional a priori assumptions on the set of singularities one can obtain weaker sufficient conditions for energy conservation. Such is the case, for example, when the singular set is a smoothly varying curve or surface in space-time. The case of a hypersurface in 3D, or a curve in 2D is especially relevant in studying vortex sheets. We establish an energy balance relation for vortex sheets that includes a correction term expressed via the jump of velocity field across the sheet. (Received December 13, 2007)