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**Hongjie Dong\*** (hdong@brown.edu), 182 George Street, Providence, RI 02912. *Rigidity of Landau's solutions to the Navier-Stokes equations.*

We consider a special class of solutions of the 3D steady-state Navier-Stokes equations (NSE) by L.D. Landau. These solutions may be calculated explicitly under the assumption of being axi-symmetric and homogeneous of degree -1. By using certain geometrical properties of the 2D sphere, V. Sverak recently proved that even if we drop the requirement of axi-symmetry, Landau's solutions are still the only solutions of NSE which are homogeneous of degree  $-1$ .

In this talk, I will show that, i) under a smallness assumption, Landau's solutions are rigid under small perturbations; ii) among smooth vector fields in  $\mathbb{R}^3 \setminus \{0\}$  satisfying  $|u(x)| \leq C|x|^{-1}$  for sufficiently small  $C > 0$ , Landau's solutions are the only ones which satisfy (NSE) in  $\mathbb{R}^3 \setminus \{0\}$ . (Received September 08, 2008)