1110-35-323   **Zhen Lei**, **Adam Navas** and **Qi S Zhang***, Math. Dept. UCR, Riverside, CA 92521. *A priori bounds for axially symmetric Navier-Stokes equations.*

Let v be the velocity of Leray-Hopf solutions to the axially symmetric three-dimensional Navier-Stokes equations. Under suitable conditions for initial values, it is proven that the modulus of v is bounded by the constant multiple of the inverse square of the distance to the axis, modulo a log term. Similar bound is proven for the angular stream function. A critical regularity condition for the vertical speed is also given. This result gives a mathematical explanation of the folklore belief that singularity can happen only if the vertical convection is high enough. This is a joint work with Zhen Lei and Adam Navas. (Received February 23, 2015)