1151-35-22   **Luan Hoang*** (`luan.hoang@ttu.edu`), Department of Mathematics and Statistics, Texas Tech University, Lubbock, TX 79409. *Asymptotic Expansions for Rotating Incompressible Viscous Fluids.*

We study the three-dimensional Navier-Stokes equations of rotating incompressible viscous fluids with periodic boundary conditions. The asymptotic expansions, as time goes to infinity, are derived in all Gevrey spaces for any Leray-Hopf weak solutions in terms of oscillating, exponentially decaying functions. In the case without the zero average condition, the oscillation is represented by "double sinusoidal" functions. Special solutions are also found which form infinite dimensional invariant linear manifolds. This is joint work with Ciprian Foias and Edriss Titi. (Received July 15, 2019)

1