1096-35-412 **Maleafisha Stephen Tladi*** (stephen.tladi@ul.ac.za), Department of Mathematics & Applied Mathemati, University of Limpopo, Sovenga, Limpopo 0727, South Africa. *Existence And Stability In Ageostrophic Flows With Viscoelastic-type Reynolds Stress.*

The author studies ageostrophic equations describing the motion of a viscous incompressible stratified fluid in a rotating system which is relevant, e.g., for Lagrangian coherent structures. These equations consist of the Navier-Stokes equations with bouyancy-term and Coriolis-term in beta-plane approximation, the divergence-constraint, and a diffusion-type equation for the density variation. They are considered in a plane layer with periodic boundary conditions in the horizontal directions and stress-free conditions at the bottom and the top of the layer. Additionally, the author considers this model with Reynolds stress, which adds hyper-diffusivity terms of order 6 to the equations. This manuscript focuses primarily on deriving ageostrophic model equations for geophysical fluids, showing existence and uniqueness of solutions, and outlining how Lyapunov functions can be used to assess stability. The main emphasis of the paper is on Faedo-Galerkin approximations as well as LaSalle invariance principle for asymptotic stability and attraction. (Received September 03, 2013)