1064-35-278 **Qingshan Chen*** (qchen3@fsu.edu), Department of Scientific Computing, Florida State University, Tallahassee, FL 32306, and **Max Gunzburger**. *Partial viscosity models for geophysical fluid dynamics.*

In this talk we discuss a set of models with partial viscosity, i.e., viscous dissipations applied to the higher modes only. Applications of such models include the modeling of geophysical turbulence, and the modeling of long-range coherent structures in the ocean and atmosphere. We establish the global well-posedness of the primitive equations with partial $\Delta$ viscosity. Employing a different technique, we also establish the well-posedness of the primitive equations with partial $\Delta^m$ viscosity; a constraint on the exponent $m$ applies. (Received September 12, 2010)