1015-35-259 **Constantin Onica*** (conica@indiana.edu), 3822 Brownridge Rd., Bloomington, IN 47401, and **Lee R. Panetta**. *Forced Two Layer Beta-Plane Quasi-Geostrophic Flow.*

We consider a model of quasigeostrophic turbulence that has proven useful in theoretical studies of large scale heat transport and coherent structure formation in planetary atmospheres and oceans. The model consists of a coupled pair of hyperbolic PDE's with a forcing which represents domain-scale thermal energy source. Although the use to which the model is typically put involves gathering information from very long numerical integrations, little of a rigorous nature is known about long-time properties of solutions to the equations. First we define a notion of weak solution, and show using Galerkin methods the long-time existence and uniqueness of such solutions. Then we show that the unique weak solution produces, via the inverse Fourier transform, a classical solution for the system. Moreover, we prove that this solution is analytic in space and positive time. (Received February 07, 2006)