Meeting: 998, Houston, Texas, SS 4A, Special Session on Nonlinear Analysis

998-35-232 **Maria E Schonbek*** (schonbek@math.ucsc.edu), University of California Santa Cruz, Department of Mathematics, Santa Cruz, CA 95064, and **Tomas P Schonbek**, Florida Atlantic University, Deaprtment of Mathematics, Boca Raton, FL 33431. *Asymptotic behavior of solutions to the 2D Quasi Geostrophic equations.*

Consideraqtion will be given to the long time behavior of solutions of the dissipative Quasi-Geostrophic equations(QG) with sub-critical powers. The flow here is described by the nonlinear scalar equation

$$\frac{\partial \theta}{\partial t} + u \cdot \nabla \theta + \kappa(-\triangle)^{\alpha}\theta = f,$$

and initial data $\theta|_{t=0} = \theta_0$. Here $\alpha \in (0, 1]$, $\kappa > 0$. The function $\theta(t) = \theta(x, t)$ represents the potential temperature. The fluid velocity u is determined from θ by a stream function ψ $(u_1, u_2) = (-\frac{\partial \psi}{\partial x_2}, \frac{\partial \psi}{\partial x_1})$ where the function ψ satisfies $(-\triangle)^{\frac{1}{2}}\psi = -\theta$. I will describe the energy decay of the solutions in various Sobolev norms. (Received February 29, 2004)