1138-35-336   **Ramjee Sharma*** (`ramjee.sharma@ung.edu`), University of North Georgia, 3820 Mundy Mill Rd, Oakwood, GA 30566. *Improved Geometric Criteria for the global regularity of 2d inviscid Surface Quasigeostrophic Equations.*

The inviscid 2D surface quasigeostrophic equations are evolution equations for scalars which are carried by a fluid flow and are given as

$$\theta_t + u \cdot \nabla\theta = 0, \quad \nabla \cdot u = 0, \quad \theta(x,0) = \theta_0(x),$$

where $\theta = \theta(x,t)$ and $x \in R^2$ or $x \in T^2$, a periodic box. The vector u is the velocity field and $u = (u_1, u_2)$. Since u is divergence free, there exists a potential function ψ such that

$$u = (-\partial_{x_2}\psi, \partial_{x_1}\psi)$$

The scalar θ is related to ψ through the relation

$$(-\Delta)^{\frac{1}{2}}\psi = \theta$$

In this presentation, we will discuss various relations between the geometry of the level curves and the regularity of the solutions. (Received February 12, 2018)

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