

On the surface quasi-geostrophic equations

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Abstract

The minicourse will discuss the surface quasi-geostrophic equation in the broader context of fluid equations. I plan to discuss:

1. Motivation: Euler and Navier-Stokes equations.
2. Nonlinear maximum principle.
3. Global regularity for critical SQG.
4. Long-time behavior: absence of anomalous dissipation of energy, finite dimensional attractors.

References

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3. P. Constantin, A. Tarfulea, and V. Vicol, Absence of anomalous dissipation of energy in forced two dimensional fluid equations, Arxiv 1305.7089 (math.AP) May 31, 2013.
4. P. Constantin and V. Vicol. Nonlinear maximum principles for dissipative linear non-local operators and applications. *Geometric And Functional Analysis*, 22(5):1289– 1321, 2012.