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Dynamics of SQG Point Vortices and Passive Scalar Transport
CECILY KEPPEL, STEFAN LLEWELLYN SMITH, MAE UCSD — The surface quasi-geostrophic (SQG) equations are a model for low-Rossby number geophysical flows in which the dynamics are governed by potential temperature dynamics on the boundary. We examine SQG point vortices, retaining the vertical velocity at first order in Rossby number. The dynamics of three SQG point vortices are determined qualitatively using a phase diagram technique. Trajectories of tracer particles are then investigated using techniques such as Poincaré sections. The effect of $O(Ro)$ corrections to horizontal velocities in the derivation of the SQG equations is also examined.

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