

Abstract Submitted
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Dynamics of SQG 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 the dynamics of SQG vortices and the resulting flow in the entire fluid including at first order in Rossby number ($O(Ro)$). This requires solving an extension to the usual QG equation to compute the velocity corrections, and we demonstrate this mathematical procedure. As we show, it is simple to obtain the vertical velocity, but difficult to find the $O(Ro)$ horizontal corrections. We then consider specific cases of interactions of vortices and examine the tracer transport properties in the interior of the fluid. We show various diagnostics for examining the effect of the vertical transport.

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