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Ellipsoidal vortices beyond the quasi-geostrophic approximation YUE-KIN TSANG, DAVID DRITSCHEL, JEAN REINARD, University of St Andrews — As a model of geophysical vortices, we study numerically the behavior of an ellipsoidal volume of uniform potential vorticity in a non-hydrostatic, rotating stratified flow. Previous studies on ellipsoidal vortices mainly focus on the quasi-geostrophic regime. Here, we aim to determine the effects of ageostrophy on the stability, evolution and the final fate of the vortices. Cyclonic and anti-cyclonic vortices of various aspect ratios are investigated. Generally, cyclonic vortices with roughly circular cross section tend to be more stable. In the cases when the vortices become unstable, a wide range of nonlinear evolution is observed including tumbling, shape vacillation, splitting and filaments shedding. Diagnostics concerning

the vortex rotation rate and the degree of "imbalance," which quantifies the amount

of internal gravity waves emission, will be presented.

Yue-Kin Tsang University of St Andrews

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