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Eleftherios Gkioulekas* (dr1f@hushmail.com), 1201 West University Drive, University of Texas Rio Grande Valley, School of Mathematical and Statistical Scienc, Edinburg, TX 78539. *The role of the asymmetric Ekman dissipation term on the energetics of the two-layer quasi-geostrophic model at large length scales.* Preliminary report.

In the two-layer quasi-geostrophic model, the friction between the flow at the bottom layer and the surface layer beneath it is modeled by the Ekman term, which is a linear dissipation term with respect to the horizontal velocity at the bottom layer. The Ekman term appears in the governing equations asymmetrically; it is placed at the bottom layer but does not appear at the top layer. A variation proposed by Salmon uses extrapolation to place the Ekman term between the bottom and surface layer or at the surface layer. In this presentation we present theoretical results that show that in either the standard or the extrapolated configurations, the Ekman term dissipates energy at large scales, but does not dissipate potential enstrophy. It also creates a stable almost symmetric distribution of potential enstrophy between the two layers. The behavior of the term changes fundamentally at large wavenumbers. (Received May 23, 2018)