

Abstract Submitted
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On the Fate of Potential Vorticity Homogenization with Magnetic Linkage and Suppression of Zonal Flows in Beta-Plane MHD T. BROWN, University of California, San Diego, S.R. KEATING, CIMS, New York University, P.H. DIAMOND, University of California, San Diego, S.M. TOBIAS, University of Leeds — We investigate the effect of external linkage by a large scale magnetic field upon the dynamics of (potential) vorticity transport and homogenization in 2D and beta plane MHD. The motivation for this study is to understand the mechanism whereby even a relatively weak mean magnetic field can suppress jet formation *at levels well below that required for simple linear “Alfvenization” of the Rossby Wave Turbulence*. In particular, we aim to elucidate the magnetic Prandtl number dependence of the vortex or jet PV gradient homogenization, thought to be required for jet formation. Analytical and computation studies of the residual PV gradient dependence on Reynolds number, Alfvenic Mach number and magnetic Prandtl number will be presented. Applications to the problem of jet formation in the solar tachocline will be discussed. This research is supported by DoE Grant Numbers FG02-04ER54738 and FC02-08ER54959.

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