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Heat Flux Suppression by Zonal Flow Shear MIKHAIL MALKOV, PATRICK DIAMOND, UCSD — The capability of thermal Rossby and drift wave turbulence, driven by a temperature gradient, to suppress the driving flux is well known. The suppression mechanism is based on zonal flow generation. Several transport bifurcation models for the L-H transition were built upon this idea. However, the microphysics of the relation between the nonlinear flux reduction and turbulence is not well understood. The models remain ambiguous in prescribing the exact location of the L-H transition. To further our understanding of the phenomenon we consider a standard 2D system of equations for the Boussinesq fluid with a temperature gradient across the fluid layer. We suggest an exact solution of this system in the limit of zero viscosity and thermoconductivity. The solution generalizes hydrodynamic solution for a traveling wave in a shear flow. The temperature gradient jumps across the critical layer. The perturbative, time dependent extensions of this solution will be discussed to elucidate the flux dependence on the cross-phase of the transport driving perturbations.

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