

Abstract Submitted
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Boundary Layer- and Streamer Flows in Interchange-unstable plasmas MIKHAIL MALKOV, PATRICK DIAMOND, UCSD — We describe the interchange instability in the simplest two-dimensional Boussinesq fluid approximation. First, using a closure procedure proposed earlier, we reduce the original two-dimensional system to a system of moment equations for the flow velocity and temperature. In the ideal fluid limit, the time asymptotic analysis of these equations predicts an unstable growth of streamers or zonal flows, depending on the initial conditions. By taking finite viscosity and thermoconductivity into account and returning to the original two-dimensional Boussinesq system, we analyze the emerging flow patterns. The link between streamer- and boundary layer flows in convective cells, which are responsible for transporting heat between the opposite walls, is studied in the limit of low viscosity and thermoconductivity for various Prandtl numbers.

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