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Gyrokinetic particle simulation of linear instabilities in DIII-D pedestal plasmas DANIEL FULTON, ZHIHONG LIN, University of California, Irvine — Understanding the physics in the pedestal region of toroidal plasmas is critical to obtaining confinement with high core temperatures. The pedestal region is characterized by large gradients in pressure, temperature, and density profiles, which provide a source of free energy to drive a number of instabilities, such as ion and electron temperature gradient modes, kinetic ballooning mode, and trapped electron modes. Studying these instabilities can provide information on the limits of allowable gradients in the pedestal. In this study, we explore linear instabilities in the pedestal region of DIII-D discharge 131997 using Gyrokinetic Toroidal Code (GTC). Results using parameters from a region at the top of the pedestal show the dominant mode to be a trapped electron interchange instability. We also demonstrate that nonlocal effects are important in this simulation regime.

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