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Full-f gyrokinetic study of Electron Temperature Gradient Mode JUGAL CHOWDHURY, SEUNG-HOE KU, ROBERT HAGER, RANDY MICHAEL CHURCHILL, CHOONG-SEOCK CHANG, Princeton Plasma Physics Laboratory, YANG CHEN, SCOTT E. PARKER, University of Colorado, Boulder, CO — There has been renewed interest on the possibility of having a substantial electron heat flux by the electron temperature gradient (ETG) modes, although they are small scale instabilities. Inside a steep transport barrier the low-k instabilities are usually suppressed to a significant degree, but some residual low-k turbulence modes can still exist. In the edge pedestal, two interesting questions remain to be answered. How will the strong background plasma dynamics interact with the ETG modes in producing transport, and how will the residual low-k turbulence affect the ETG modes. The strong background plasma dynamics include the self-organized plasma profile and rotation profile, and the ExB shearing profile. There have been gyrokinetic studies for the ETG mode using reduced delta-f methods in which the driving forces from background plasma gradients are fixed and, at the same time, simplified without the magnetic drift driver. The questions raised here requires a full-f simulation. In this presentation, we study the first question under the simplification that all other turbulence modes are completely suppressed in the edge pedestal. We use the full-f 5D gyrokinetic code XGC1 with diverted magnetic geometry. We will compare the results with the simplified delta-f simulations.

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