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Collision effect on ITG turbulent transport in an L-mode pedestal in real geometry tokmak edge[1] SEUNG-HOE KU, C.S. CHANG, Courant Institute, New York University, CPES TEAM — Even though the Ion temperature gradient (ITG) driven turbulence yields a robust plasma transport, it has not been considered to be a plausible candidate for the transport (and L-H transition) mechanism in the L-mode pedestal due to the weak ion temperature gradient ($\eta_i < 2$) compared to the density gradient and the strong background ExB shearing rate. Surprisingly, in a real tokamak edge geometry with a magnetic separatrix, the full-f XGC1 gyrokinetic particle-in-cell code finds that there is a strong and fast ITG turbulence spreading from the density pedestal top ($\eta_i > 3$) into the pedestal slope ($\eta_i < 2$), with the ion heat conductivity in the entire edge pedestal region roughly similar to the experimentally inferred level. XGC1 uses a numerical magnetic and limiter geometry from a g-eqdsk data. Unlike a delta-f kinetic code, the full-f XGC1 code simulates the turbulence and the background plasma dynamics together. Coulomb collision frequency has a strong radial variation across the pedestal. Emphasis of this presentation will be given to the Coulomb collision effects on the edge ITG turbulence and transport.

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Seung-Hoe Ku
Courant Institute, New York University

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