Convergence Study of Long-Term ITG Turbulence Simulations with the GTC Code[1] S. ETHIER, W.W. LEE, W.M. TANG, Princeton Plasma Physics Laboratory — The 3D gyrokinetic particle-in-cell code GTC has been successfully employed in studying microturbulence in toroidal fusion devices for several years now [1]. Recently, new GTC simulations of ITG turbulence using the adiabatic electron approximation but including the usually ignored ion velocity-space nonlinearity showed a faster evolution towards steady-state than the original simulations without this extra term [2]. In this work, several simulations of this type are carried out to assess the convergence of the steady-state transport for an increasing number of particles at a fixed device size. The resulting ion thermal conductivity, entropy production, and perturbed velocity-space distribution will be presented.

[1] Z. Lin, T. S. Hahm, S. Ethier, and W. M. Tang, *Phys. Rev. Lett.* **88**, 195004 (2002).
[2] W. W. Lee, "Steady State Global Simulations of Microturbulence," *Bull. Am. Phys. Soc.* **49**, no. 8, 135 (2004).

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