Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Study of the L-Mode tokamak plasma "shortfall" with local and global nonlinear gyrokinetic δf simulation JUGAL CHOWDHURY, WEIGANG WAN, YANG CHEN, SCOTT E. PARKER, University of Colorado, Boulder, Colorado 80309, USA, RICHARD J. GROEBNER, General Atomics, Post Office Box 85068, San Diego, California 92186, USA, CHRISTOPHER HOLLAND, University of California-San Diego, La Jolla, California 92093, USA, N.T. HOWARD, Oak Ridge Institute for Science and Education (ORISE), Oak Ridge, Tennessee 37831, USA — L-Mode plasmas in DIII-D and Alcator C-Mod tokamaks have been analyzed using the nonlinear gyrokinetic simulation GEM based on particle-in-cell method. It is observed that the simulation results for ion heat flux are close to the experimental values at the core, but substantially lower than the experimental results at the outer radial location in the DIII-D case. On the contrary, the simulations show good agreement with the experimental values of heat flux for ions in Alcator C-Mod. Global simulations are carried out for DIII-D L-Mode plasmas to study the effect of turbulence spreading from the edge into the outer core where the ion heat transport shortfall is observed. It is found that edge turbulence enhances the outer core ion heat transport significantly through turbulence spreading. However, ion heat flux in the shortfall region even in the presence of the edge drive is still much lower than the experimentally observed value.

Jugal Chowdhury
University of Colorado, Boulder, Colorado 80309, USA

Date submitted: 11 Jul 2014 Electronic form version 1.4