Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Advective turbulent transport in the fluid plasma[1] BYUNG-HOON MIN, CHAN-YONG AN, CHANG-BAE KIM, Soongsil U — The Hasegawa-Wakatani model (HWM) has been employed in pedagogical analyses of the physics behind the behavior of the tokamak plasmas. In addition to the geometric simplicity HWM has an appealing feature of sustaining autonomous quasi-steady state, unstable modes providing the power that is being transported by the nonlinear interactions and is eventually dissipated by the collisional damping at small scales. Emergence of the zonal flow out of the turbulence is a main candidate to cause the transition from the low plasma confinement to the high mode. In the study of such LH transition with the HWM, the adiabaticity parameter has been shown to play an important role in forcing the zonal flow that results in the regulation of the drift-wave turbulence. Instead of concentrating on the physics of the feedback loop between the turbulence and the zonal flow the present study focuses on the presence of the advective transport of the energy. Numerical simulations of HWM are performed and the connections between the advective transport and the zonal flow will be presented.

[1]This work was supported by the Supercpmputing Center/Korea Institute of Science and Technology Information with supercomputing resources including technical support (KSC-2013-C1-009).

Chang-Bae Kim
Soongsil U

Date submitted: 12 Sep 2013 Electronic form version 1.4