Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

The role of conserved quantities in turbulence simulations INGMAR BROEMSTRUP, WILLIAM DORLAND, MICHAEL BARNES, KYLE GUSTAFSON, University of Maryland — Direct numerical simulations of plasma turbulence have become an important tool for interpreting experimental data from tokamaks. There is, however, relatively little exploration of the fluctuation data that is produced by gyrokinetic simulations in the literature. In preparation for more detailed experimental validation of predictions from gyrokinetic simulations of plasma turbulence, we present studies of decaying turbulence and the influence of the conserved quantities to the cascading processes. Therefore we study first two simplified models: the Hasegawa-Mima model and a second model that allows for finite ion temperatures in the Hasegawa-Mima framework. Both models are studied using a spectral fluid code and a PIC code. The main focus is on how increasing the ratio of ion to electron temperature changes the cascading behavior. We will also discuss how the different simulation algorithms treat fine-scale velocity-space structure.

Ingmar Broemstrup
University of Maryland

Date submitted: 24 Aug 2007 Electronic form version 1.4