Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Benchmarking of the Gyrokinetic Microstability Codes GENE, GS2, and GYRO over a Range of Plasma Parameters[1] RONALD BRAVENEC, Fourth State Research, JONATHAN CITRIN, FOM Institute DIFFER, PAOLA MANTICA, Instituto di Fisica del Plasma "P. Caldirola", JERONIMO GARCIA, CEA, IRFM, M.J. PUESCHEL, University of Wisconsin, Madison, TOBIAS GOERLER, Max Planck Institute for Plasma Physics, MICHAEL BARNES, Oxford University, JEFF CANDY, EMILY BELLI, GARY STAEBLER, General Atomics, JET CONTRIBUTORS TEAM — Comparing results (linear frequencies, eigenfunctions, and nonlinear fluxes) from different gyrokinetic codes as a means of verification (benchmarking) is only convincing if the codes agree over a wide range of plasma conditions. Otherwise, agreement may simply be fortuitous. We present here linear and nonlinear comparisons of the Eulerian codes GENE, GS2, and GYRO for a variety of JET discharges. The discharges include a simplified, 2-species, circular geometry case based on an actual JET discharge, an L-mode discharge with a significant fast ion pressure fraction, and a carbon-wall low triangularity hybrid discharge. All discharges were studied at rho=0.33 where significant ion temperature peaking is observed. The benchmarking is carried out to verify the GENE predictions that fast-ion-enhanced electromagnetic stabilization is the main contributor to the low ion heat flux.

[1]Supported by U.S. Dept. of Energy through grant DE-FG02-08ER54978 and EUROfusion No 633053

Ronald Bravenec
Fourth State Research

Date submitted: 27 Oct 2015 Electronic form version 1.4