Abstract Submitted
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Developing Experimentally Relevant Benchmarks for Gyrokinetic Microstability Codes[1] R. BRAVENEC, Fourth State Research, J. CANDY, General Atomics, W. DORLAND, Univ. of Maryland, D. ERNST, MIT, G. STAEBLER, R. WALTZ, General Atomics — A few nonlinear gyrokinetic microstability codes are now capable of simulating tokamak plasmas to an unprecedented level of complexity. Verification of these "experimentally relevant" simulations is difficult, however, because no benchmarks exist with which the codes can compare. This work describes the development of such benchmarks through "apples-to-apples" comparisons among codes, i.e., comparisons for the same plasma containing the same physics and having sufficient temporal, spatial, pitch-angle, and energy resolutions. A single utility code is used to extract experimental data from analysis by TRANSP, ONETWO, etc., and to produce input files for all the codes. The codes are first run linearly and, if differences in the mode frequencies are found, the computations are simplified by removing shaping, collisions, etc., one at a time, until agreement is reached. This process pinpoints the source(s) of the disagreement which the code developers attempt to resolve. Next, nonlinear runs are undertaken for the same cases and the procedure is repeated. The final results are both linear and nonlinear benchmarks at various levels of complexity by which other codes may be verified.

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