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☒ Theory ☐ Experiment

Hybrid TGLF-GYRO Steady-State Transport Calculations With TGYRO,* J. Candy, R.E. Waltz, *General Atomics*, M. Fahey, *ORNL* – We report on the status and development of TGYRO, a steady-state transport manager which enables GYRO [1] to be used for steady-state transport calculations. This project is partner to the larger FACETS SciDAC project.

Currently, TGYRO has two distinct operational modes: a **local** and a **global** mode. In this presentation we focus on the local mode only, for which a Newton-type iterative scheme is applied to local transport flux computations, including GYRO gyrokinetic simulations. Iteration continues until the turbulent fluxes match target fluxes determined by (a) self-consistent thermonuclear sources, radiation, exchange, etc, or (b) imposed target fluxes derived from experimental power balance. This approach makes significant use of the TGLF [2] transport model.

In this presentation we will discuss the success and limitations of the iterative solver as applied to GYRO simulations, and the use of hybrid TGLF-GYRO flux calculations to enhance robustness and speed convergence of the method.

[1] J. Candy, R.E. Waltz, *J. Comput. Phys.* **186**, 545 (2003).

[2] J.E. Kinsey, et al., *Phys. Plasmas* **15**, 055908 (2008).

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