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Global-local gyrokinetic simulations of the tokamak pedestal[1] DENIS ST-ONGE, FELIX I. PARRA, MICHAEL BARNES, University of Oxford —
We develop a novel approach to gyrokinetics where multiple flux-tube simulations are coupled together in a way that consistently incorporates global profile variation while retaining spectral accuracy. By doing so, the need for Dirichlet boundary conditions, where fluctuations are nullified at the simulation boundaries, is obviated. These conditions, which are typically employed in global gyrokinetic simulation, prevent convergence to the local periodic limit unless large simulation domains are utilized. Thus, our method of global-local gyrokinetics is appropriate for simulations of the pedestal region where the generation of intrinsic momentum is expected to commence and the details of boundary physics are important. Preliminary results from simulations with equilibrium flow shear using this approach are compared to simulations using conventional global methods and to local flux-tube simulations with wavenumber-remapped flow shear. Progress is also reported on implementing profile variation in both the plasma pressure and magnetic geometry.

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