Abstract Submitted
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Towards Two-Scale Simulations of Global Tearing Coupled With Microturbulence[1] T. JITSUK, University of Wisconsin - Madison, Z. R. WILLIAMS, Hope College, M. J. PUESCHEL, University of Texas at Austin, P. W. TERRY, University of Wisconsin - Madison — Various studies have highlighted the possible impact of large-scale tearing activity on microturbulence, zonal flows, and small-scale transport, with particularly striking effects in the reversed-field pinch. To predict such physics self-consistently, a multi-scale global framework is required. Here, linear and nonlinear tearing-mode physics are investigated with the gyrokinetic turbulence code GENE, using three different implementation levels for the current-gradient drive: as part of the fluctuating distribution, as a fixed background but varying on the microscale, and using shifted Maxwellians as the background distribution along with a global profile. The differences in the linear behavior of these three approaches are discussed, as are the differences in the means by which tearing modes ultimately saturate. Separately, the impact of tearing modes and associated turbulence on micro-scale modes such as ion-temperature-gradient-driven or trapped-electron mode turbulence is investigated.

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