

Abstract Submitted
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Implementation of compressional magnetic field fluctuations in global GENE¹ S.-W. TSAO, M.J. PUESCHEL, D.R. HATCH, University of Texas at Austin — The gyrokinetic framework has been successful in simulating a variety of phenomena in fusion and astrophysical plasmas. Past research has mostly focused on electrostatic and shear-magnetic fluctuations, neglecting compressional magnetic fluctuations. This is particularly true in the cases of global gyrokinetics, for which a self consistent treatment of parallel magnetic fluctuations had not been derived until now. The effects of compressional magnetic fluctuations could be significant in several systems that require global treatment, for example, tokamak pedestals, magnetic reconnection in solar coronas, and LAPD high- β experiments. [Pueschel et al., PoP 22, 062105 (2015)] The radially global gyrokinetic framework including compressional fluctuations is derived. Benchmarked with well-established local field-aligned simulations, we present an initial implementation of these equations in the gyrokinetic turbulence code GENE.

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