Abstract Submitted
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Gyrokinetic simulations of nonlinear kinetic processes in magnetized plasmas[1] ZHIHONG LIN, YASUTARO NISHIMURA, IGOR HOLOD, WENLU ZHANG, HONGPENG QU, PETER PORAZIK, XI CHENG, LIU CHEN, University of California, Irvine — In fusion and space plasmas, kinetic processes play important roles in the excitation and saturation of compressional magnetic pulsations, in the plasma heating by Alfvenic turbulence, and in the cross field transport. The interplay between fluid and kinetic processes often regulates the nonlinear evolution of both microscopic and macroscopic phenomena. Nonlinear simulation needs to treat the disparate temporal-spatial scale dynamics on an equal footing. Physics progress and numerical methods for multiscale gyrokinetic particle simulations will be discussed for mirror modes in high-beta plasmas, spectral cascade and plasma heating in Alfven turbulence, and turbulent transport in fusion plasmas.

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Zhihong Lin
University of California, Irvine

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