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Effects of compressional magnetic perturbation on kinetic Alfven waves[1] GE DONG, AMITAVA BHATTACHARJEE, Princeton Plasma Physics Laboratory, ZHIHONG LIN, University of California, Irvine — Kinetic Alfven waves play a very important role in the dynamics of fusion as well as space and astrophysical plasmas. The compressional magnetic perturbation $\delta B_{||}$can play important role in kinetic Alfven waves (KAW) and various instabilities at large plasma β. It could affect the nonlinear behavior of these modes significantly even at small β. In this study, we have implemented $\delta B_{||}$in gyrokinetic toroidal code (GTC). The perpendicular Ampere's law is solved as a force balance equation. Double gyroaveraging is incorporated in the code to treat the finite Larmor radius effects related to $\delta B_{||}$terms. KAW is studied in slab geometry as a benchmark case. A scan in β for the KAW dispersion relation shows that as β approaches 1 ($>$0.3), the effects of $\delta B_{||}$becomes important. Connections are made with other existing studies of KAWs in the fusion and space plasma literature. This new capability of including $\delta B_{||}$in GTC could be applied to nonlinear simulations of modes such as kinetic ballooning and tearing modes.

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