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Formulation and verification of simulation model near the ion cyclotron frequency. PENGFEI LIU, University of California, Irvine, YANGYANG YU, Department of Physics, Peking University, ZHIHONG LIN, University of California, Irvine — A simulation model using fully kinetic ions and drift kinetic electrons in toroidal geometry (such as tokamaks), has been formulated and verified for simulations of waves with frequencies comparable or higher than ion cyclotron frequency, such as ion cyclotron emission (ICE) and global Alfvén eigenmode (GAE). Quasi-neutrality condition is used to remove the undesired higher frequency electron plasma waves. The kinetic electron model can be reduced to the massless fluid electron, which recover the modified shear Alfvén wave (SAW) and generalized ion Bernstein waves (IBW). The model further reduces to shear Alfvén wave (SAW) and compressional Alfvén waves (CAW) when ion kinetic effects are removed. Implementation and verification in the gyrokinetic toroidal code (GTC) will be reported.

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