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**PIC simulations of whistler wave generation using plasma conditions from the RAM-SCB model** YIQUN YU, LEI ZHAO, LANL, BO PENG, KTH, GIAN LUCA DELZANNO, VANIA JORDANOVA, LANL, STEFANO MARKIDIS, KTH — Wave-particle interactions play an important role in the Earth's inner magnetospheric dynamics. We study the whistler wave generation with an implicit particle-in-cell code (iPIC3D) within unstable equatorial regions identified by the kinetic ring current model RAM-SCB. During storm time, RAM-SCB shows that hot electrons on the dayside demonstrate high temperature anisotropy and are unstable to whistler wave excitation. By using plasma parameters from RAM-SCB, we carry out iPIC3D simulations assuming a bi-Maxwellian distribution for electrons. We find that with an electron temperature anisotropy of 4, electron density of 6 $\mathrm{cm}^{-3}$, and parallel temperature of 1 keV on the dayside around $L \sim 5.5$, whistler waves are rapidly excited and propagate along the background magnetic field. Comparisons with linear theory show good agreement. The electron velocity distribution is significantly changed after wave generation, with smaller anisotropy due to the pitch-angle scattering. Furthermore, test particles are tracked in the whistler wave environment and the pitch-angle diffusion coefficient is extracted. The coefficient generally agrees with quasi-linear theory prediction with slight deviation even when the wave amplitude is as large as 5% of the background magnetic field.

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