

Deformation of electron pitch angle distributions by Upper Band Chorus: Numerical verification for Arase observations

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Arase satellite observed deformation of electron pitch angle distributions associated with upper band whistler chorus waves. The observation showed that time scale of the deformation is too fast to be described by quasi-linear theory. It suggests that assumption applied to quasi-linear theory, which is broad wave spectrum with random phase and linear correlation of diffusion coefficients with wave power, is not a dominant process in the electron scattering. To study the deformation of electron pitch angle distributions by observed upper band whistlers, we have done GEMSIS-RBW simulations with realistic physical parameters observed by Arase satellite during the event (2017/4/8 19:20:17 - 19:20:49). We compare simulation results with data obtained from Medium Energy Particle experiment-electron analyzer (MEP-e) on Arase satellite during the time interval. We will show numerical results of electron scattering process by upper band whistlers, and discuss contribution of non-diffusive electron scattering process to the deformation of electron pitch angle distributions.

Keywords: radiation belts, electron scattering, test-particle simulation