

A simple stochastic model of electron diffusion by whistler waves in a non-uniform magnetic field

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Scattering/acceleration of electrons by electromagnetic waves is a fundamental process to generate relativistic electrons in the inner magnetosphere. Although quasi-linear theories have widely been used to discuss the electron diffusion, the significance of nonlinear wave-particle interactions is also commonly recognized. Recently, we proposed a simple model of the charged particle diffusion including both stochastic and coherent processes [Nariyuki, POP, 2019]. In this presentation, we apply the model to electron diffusion in a simplified dipole magnetic field. Dependence of pitch-angle diffusion on parameters is discussed in detail.

Keywords: electron diffusion, whistler wave, stochastic model