The origin of stochastic nature in the quasilinear diffusion process

Masahide Iizima[1]

[1] Geophysical Inst., Tohoku Univ.

As one of the most promising candidate processes to accelerate electrons and to form radiation belt electrons during magnetic storm, stochastic acceleration by the whistler mode chorus waves has been extensively studied by many researchers. The acceleration process, thus, essentially involves random elements like Brownian motion and is generally discusssed by using the Fokker-Planck equation where the diffusion coefficients are calculated on the basis of the quasilinear diffusion equastion which includes resonant wave-particle interaction processes. In the present paper, we would like to discuss the origin of the stochastic nature in the quasilinear diffusion process and show the physical requirement to justify that the quasilinear diffusion process can be considered as the stochastic process.