Computer simulations of whistler mode wave-particle interaction by a test particle Vlasov code

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In order to study the electron acceleration mechanism in the outer radiation belt, we consider nonlinear effects of wave-particle interaction in stead of the quasi-linear theory.

We treated cyclotron resonance with whistler-mode chorus emissions in a nonuniform geomagnetic field in computer simulations. We assume that chorus emission a coherent monochromatic wave with a fast rising tone.

We have developed a test-particle Vlasov code and studied how velocity and pitch angle distribution change. We find the distribution function of resonant electron is strongly modified thorough nonlinear wave-particle interactions, which is compared with the quasi- linear diffusion theory.