Formation of pancake distribution of energetic electrons at the equator through nonlinear trapping by chorus emissions

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Whistler-mode chorus emissions can interact with resonant electrons in a wide energy ranges. The resonant electrons are effectively scattered in the nonlinear process. We study an energization process of magnetospheric electrons associated with generation of the whistler-mode rising chorus emissions near the geomagnetic equator in a self-consistent electromagnetic full-particle simulation. The simulation shows that the nonlinear resonant interactions result in distinct scatterings process by acceleration of trapped resonant electrons trapped and deceleration of untrapped resonant electrons. Additionally, increasing frequency of rising chorus emissions can carry trapped electrons toward higher pitch angles and untrapped electrons toward lower pitch angles. We suppose that successive generations of rising chorus element near the equator are appropriate to contribute to energization of magnetospheric electrons.