E109-005 **Room: 101A** **Time: May 30 10:00-10:15**

Rapid energization of relativistic electrons by nonlinear wave trapping

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We utilize a self-consistent particle code to investigate the acceleration of relativistic electrons via nonlinear wave trapping by whistler-mode chorus emissions.

Whistler-mode chorus emissions are narrow band electromagnetic emissions observed on the dawn side of the Earth's magnetosphere. Results of *in situ* observations reveal that the emissions, which often consist of rising tones, are generated in the equatorial region of the magnetosphere. It is further observed that chorus activity is enhanced during geomagnetically disturbed periods.

Recently we have reproduced the generation process of chorus emissions by using a large-scale particle simulation. We have also found in the simulations that the majority of electrons lose energy, contributing to the generation of chorus emissions, while a fraction of resonant electrons having large pitch-angles are simultaneously energized through nonlinear wave trapping by the chorus emissions. Highly accelerated electrons show a characteristic behavior which is explained by the relativistic turning acceleration (RTA) process. Furthermore, accelerated relativistic electrons undergo efficient energization as a result of the ultra-relativistic acceleration (URA) process followed by RTA.

We discuss the characteristics of efficiently energized electrons in the simulation results, and we present evidence for rapid electron acceleration by the sequence of RTA and URA interactions.