

R008-24

Zoom meeting D : 11/4 PM1 (13:45-15:30)  
14:45-15:00

## **Electron scattering and acceleration at quasi-perpendicular shock: Comparison between PIC simulation and MMS observation**

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Non-thermal electrons with power-law energy spectra are directly observed at Earth's quasi-perpendicular bow shock. Magnetospheric Multiscale (MMS) spacecraft, with the high time resolution of electron measurements, give us an opportunity to reveal electron scattering and acceleration processes at the Earth's bow shock. In fact, Oka et al. (2017, 2019) reported in-situ evidences of pitch-angle scattering of non-thermal electrons by whistler waves using MMS data.

We have performed a PIC simulation of quasi-perpendicular collisionless shock to apply the Earth's bow shock. Our PIC simulation has reproduced energetic electron features reported by Oka et al., (2017, 2019) as follows: (1) broadening of the upstream pitch-angle distribution toward the shock, (2) power-law energy spectrum in the shock transition region, (3) burst of energetic electron in the foot region, and (4) electron hole in the downstream pitch-angle distribution. To understand these electron features, we analyze the trajectories of scattered/accelerated electrons in detail. We will discuss the electron acceleration related with the shock drift acceleration. Also, we will discuss the electron burst associated with the shock reformation, as previous PIC simulations reported (Lembege and Savoini, 2002; Matsukiyo and Scholer, 2012).