

R006-20

Zoom meeting B : 11/1 PM2 (15:45-17:30)  
16:30-16:45

## **On the origin of cold-dense plasmas in the dusk magnetotail plasma sheet: MMS observations**

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The near-Earth plasma sheet becomes cold and dense under northward interplanetary magnetic field (IMF) condition, which suggests entry of solar wind plasma into the magnetosphere across the magnetopause. The cold and dense trend of the plasma sheet is more apparent in the magnetotail flank regions that are interface between cold solar wind plasma and hot magnetospheric plasma. Several physical mechanisms have been proposed to explain the solar wind plasma entry across the magnetopause and resultant formation of the cold-dense plasma sheet (CDPS) in the tail flank regions. However, transport path of the cold-dense plasma inside the magnetotail has not been understood yet. Here we report a case study of CDPS in the dusk magnetotail by MMS (Magnetospheric Multiscale) spacecraft under strongly northward IMF and high-density solar wind conditions. The ion distribution function consists of high-energy and low-energy components, and the low-energy one intermittently shows energy dispersion in the directions parallel and anti-parallel to the local magnetic field. Considering the time-of-flight effect of the energy-dispersed ions, we infer that the low-energy ions have their origin in the region down the tail, and move along the magnetic field toward the ionosphere and then come back to the magnetotail by the mirror reflection. The longer energy dispersion observed in the developed CDPS shows a longer path length and suggests a change of the injection source to the regions further down the tail.