E118-002 **Room: 304** **Time: May 19 14:00-14:15**

Particle mixing process by the MHD-scale Kelvin-Helmholtz vortex: Full particle simulations

Takuma Nakamura[1]; Iku Shinohara[2]; Hiroshi Hasegawa[2]

[1] ISAS,JAXA; [2] ISAS/JAXA

We have performed two-dimensional full particle (EM-PIC) simulations to investigate the plasma mixing process in the MHD-scale Kelvin-Helmohltz (KH) vortex. The KH vortex has been considered as one of the most important processes at the planet's magnetospheric boundaries for causing not only momentum and energy transport through the boundaries but also plasma mixing across the boundaries. Traditionally, the plasma mixing by the vortex has been believed to occur hydrodynamically in the highly rolled-up vortex. Unlike a hydrodynamic case, however, since it is difficult for plasmas to move across the magnetic field lines, it is difficult for plasma mixing to occur evenly across the vortex. On the other hand, recent two-fluid (ion and electron) simulations have been confirmed that the plasma mixing across the vortex can occur in the anti-parallel case, in which the magnetic field components along the k-vector of KH instability are anti-parallel across the velocity shear layer. In this case, magnetic reconnection driven by the flow of KH vortex can lead to the plasma mixing across the shear layer. In the two-fluid system, however, since the motion of particles is not considered the mixing process of plasmas cannot be accurately understood. Thus, in this study, to understand the plasma mixing process quantitatively we use full particle simulations of MHD-scale KH vortex for the anti-parallel case. As a result, we found that both ions and electrons are evenly mixed across the vortex on a time-scale of the growth of the vortex.