E118-001 **Room: 304** **Time: May 19 13:45-14:00**

Structural development of Kelvin-Helmholtz vortices at the Earth's magnetopause

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We examine traversals on 20 November 2001 of the equatorial magnetopause boundary layer simultaneously at ~15 MLT by the Geotail spacecraft and at ~19 MLT by the Cluster spacecraft, which detected rolled-up MHD-scale vortices generated by the Kelvin-Helmholtz instability (KHI) (Hasegawa et al., 2004), under prolonged northward interplanetary magnetic field conditions. Our purpose is to reveal the excitation process of the KHI, MHD-scale structures of the vortices, and the formation mechanism of the low-latitude boundary layer (LLBL). The KH wavelength more than $4x10^4$ km is considerably longer than predicted by the linear theory with thickness ~1000 km of the dayside velocity shear layer, where no significant surface wave was observed. Our analysis shows that seed perturbations on the day side, possibly from high-latitude reconnection, are important for the nonlinear KHI development on the flanks. Grad-Shafranov-like reconstruction of streamlines (Hasegawa et al., 2007) and wavelet analysis of the total pressure suggest that breakup and coalescence of the vortices were beginning around 19 MLT. Comparison between the dayside and flank LLBLs suggests that in addition to high-latitude reconnection on the day side, plasma entry across the flank magnetopause via diffusion and/or remote reconnection unidentified by Cluster contributed to the generation of the flank LLBL.

Hasegawa, H., et al. (2004), Transport of solar wind into Earth's magnetosphere through rolled-up Kelvin-Helmholtz vortices, Nature, 430, 755-758, doi:10.1038/nature02799.

Hasegawa, H., et al. (2007), Recovery of streamlines in the flank low-latitude boundary layer, J. Geophys. Res., 112, A04213, doi:10.1029/2006JA012101.