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ポスター 2 : 11/5 AM1/AM2 (9:00-12:30)

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High spatial resolution simulation of global Jovian magnetosphere for vortex configuration

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For a number of years we have studied the magnetospheres of Jupiter, Saturn and Earth by using 3-dimensional magnetohydrodynamic (MHD) simulations. In the simulation of Saturn's magnetosphere, we have obtained the clear vortex configuration of plasma flow. Using the fastest supercomputer at that time (K-computer), we could represent the vortices in the Terrestrial magnetosphere. However, we have not been able to get the vortex configuration along the magnetopause in the Jovian magnetosphere due to the size of numerical simulation grid spacing. The size of Jovian magnetosphere is huge with its strong intrinsic magnetic field so that the high spatial resolution numerical simulation of the magnetosphere becomes hard to be performed since the requirement of computer memory and CPU is unrealistic.

Considering this situation, we have done the approach that the simulation with the supercomputer in Japan has been performed for over three years to be obtained the time series variation of global magnetosphere. From the simulation over years we have obtained over 200 hours' time evolution and found the vortex configuration in the Jovian magnetosphere with 0.15RJ grid spacing and 1.5TB simulation data/sampling (totally using over 1PB disk storage). In this study, we will show the results of high-resolution simulation and discuss the configuration vortices.