PCG033-P05   Room:Convention Hall   Time:May 24 14:00-16:30

The high resolution MHD simulation of Kronian magnetosphere for northward and southward IMF

Keiichiro Fukazawa[1]*, Tatsuki Ogino[2], Kiyohumi Yumoto[3]

[1]EPS, Kyushu Univ., [2]STEL, Nagoya Univ., [3]SERC, Kyushu Univ.

In a series of studies we have reported vortices at the dawn magnetopause at Saturn in simulations when IMF was northward which we interpreted at resulting from the Kelvin Helmholtz (K-H) instability. Studies of the K-H waves using quasi-local simulations at the Earth have shown that the formation of the vortices can be highly dependent on the grid spacing used in the simulations. In particular there can be secondary variations in the vortex structure. However these simulations did not include the magnetic curvature which affects the occurrence of KH instability because they do not treat the global configuration. On the other hand, it has been hard to simulate the global magnetosphere with a sufficiently small grid interval to investigate these effects on the global configuration. Recently thanks to the developments of computer and numerical calculation techniques, we have been able to perform the global magnetospheric simulations of the magnetosphere with relatively high resolution (small grid spacing). As the results of this simulation of Kronian magnetosphere, we found that the formation process and configuration of vortex were different from the previous low resolution simulations for northward IMF. In particular, the growth rate of KH wave seems to be high and waves is appeared around dusk side clearly. On the other hand, we have not obtained the vortex configuration for southward IMF. In this study we will show the results of high resolution global simulation of the Kronian magnetosphere, analysis of the vortices, changes in the configuration of magnetic field lines related to the vortices and their effects on aurora at Saturn.

Keywords: Saturn, magnetosphere, numerical simulation