

高解像度土星磁気圏シミュレーションにおける渦構造の形成 Formation of vortex configuration in the high resolution simulation of Kronian magnetosphere

深沢 圭一郎^{1*}

FUKAZAWA, Keiichiro^{1*}

¹ 京都大学学術情報メディアセンター

¹ Academic Center for Computing and Media Studies, Kyoto University

In a series of our simulation studies we have found turbulent convection and vortices formed at Saturn's dawn and dusk magnetopause in simulations when IMF was northward. We interpreted these vortices as resulting from the Kelvin Helmholtz (K-H) instability. The resolution of simulation is important parameter for formations of vortex and turbulent convection to catch the small configuration of convection which can be a trigger of vortex. Recently we can perform the higher resolution simulation (0.06Rs) of our previous simulation (0.3 or 0.1Rs) thanks to the evolution of computer technologies. In this study we run the simulation of Kronian magnetosphere with various IMF conditions to see the configuration of vortex and magnetospheric convection.

As the results of simulations the vortex does not appear in the no IMF and weak northward IMF condition. Adding the mean magnitude of northward IMF, we obtained the vortex along the magnetopause in the dawn and dusk. The difference of overall configuration between the weak and normal northward IMF is formation of vortex and other configurations very resemble. From these results we will discuss the formation condition of vortex in the Kronian magnetosphere and their configurations.

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