

## An MHD simulation of the magnetosphere in the cubed-sphere coordinate system

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Recently, an attempt to comprehend the magnetosphere-ionosphere (M-I) coupling system as a holistic compound system has progressed. For the understanding of the physical processes in the M-I compound system, a high-resolution simulation that can self-consistently take into account both of the magnetospheric and the ionospheric processes may play a crucial role. Not only the resolution, computational efficiency, and robustness in numerical scheme but also the adequateness and tractability of grid system are important requirements to realize the high-accurate simulation. From this point of view, in this study, we have developed the high-resolution simulation model of the M-I compound system based on the cubed-sphere coordinate system.

Since the cubed-sphere coordinate system is a structured grid system with the same topology as the cubic grid system, it can be easily set up and implemented with vector/parallel computers. Moreover, since the cubed-sphere coordinate system may provide nearly uniform resolution, one can maintain proper time step during the calculation with that. On the other hand, in this system, there are eight singular points that correspond to the vertices of cube. However, the singularity can be avoided by adopting the finite-volume method. Particularly, in this talk, we will argue the property of the cubed-sphere coordinate system as the global frame-work of magnetospheric MHD simulation, showing some preliminary results.