

## Production and validation of GPVs in the space weather

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The global MHD simulation of the magnetosphere-ionosphere system is unique because it offers another magnetosphere-ionosphere system independent of observations. It is noteworthy that the simulated magnetosphere-ionosphere system should be true (realistic) as long as we are concerning to large-scale, slow-varying phenomena. Based on this simulation, for example, Tanaka [2003] proposed a new paradigm that the magnetosphere-ionosphere system must be investigated in terms of the compound system where all elementary processes are interacted each other in a self-consistent manner. Fujita et al [2005] also proposed the idea that many global variations can be regarded as state transition of the magnetosphere-ionosphere compound system.

On the other hand, the global MHD simulation produces the grid-point values (GPVs). Bearing in mind that the GPVs produced in the weather forecast simulation offer the meteorologists fundamental data for investigation, we may use the space weather simulation as a potential tool for the space science research in the same manner. Thus, as a next step of application of the global MHD simulation, we need to evaluate validity of the simulation by comparing some simulated values and corresponding observed ones. For this purpose, we calculate the AE indices from the real-time MHD simulation of the space weather conducted by Simulator Group of Applied Research and Standard Division, National Institute of Information and Communications Technology (NICT).

In the talk, we first present several examples of utilization of the GPVs in the space science. Next, the virtual AE indices are discussed.