

Development of real-time prediction system of CME arrival and magnetic field with ensemble SUSANOO-CME simulation

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The predictions of CME arrival to the Earth and the southward magnetic field brought by the CME flux ropes are one of crucial tasks for space weather forecast.

We have developed an MHD simulation of the interplanetary propagation of multiple CMEs with their internal magnetic flux ropes, called as SUSANOO-CME (Shiota & Kataoka 2016). The simulation solves propagation of solar wind and CMEs in the inner heliosphere from 25 solar radii where all the bulk flow exceeds fast mode speed. The information of solar wind and CME is specified at the inner boundary with empirical and analytical models using real-time observations of the Sun and the corona.

Recently, we have been constructing a prediction system of CME impacts (CME arrival and magnetic field) utilizing SUSANOO-CME with the real-time solar observations for the purpose of use in space weather forecast in NICT. The system is capable of performing ensemble simulation with different sets of multiple CME input parameters, which is controlled from web-browser interfaces. We developed a methods to visualize results of each ensemble case and summarize time profiles of the ensemble simulations, which are also accessible through a web-browser. In this presentation, we will report the current status of the development and discuss the remaining issues and the future development.

Keywords: CME, solar wind, space weather forecast