A study for the improvement of SUSANOO-solar wind model

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The Earth is exposed to solar wind that emanates constantly from the Sun and influences the structure and dynamics of the magnetosphere of the Earth. Hence, the prediction of solar wind is crucial for the space weather forecast.
In recent years, our group have developed a space weather prediction model: SUSANOO (Space-weather-forecast-Usable System Anchored by Numerical Operations and Observations), which can predict the solar wind profile at the Earth's orbit and high-energy electrons flux of the radiation belt on the basis of three-dimensional MHD simulation of solar wind (SUSANOO-SW) [Shiota et al., 2014]. Although SUSANOO-SW may reproduce the large-scale three-dimensional structures of solar wind on the basis of observation of the photospheric magnetic field, the model is not yet able to well reproduce the observation of the short term variation of solar wind and the amplitude of fast solar wind velocity.
In this research, we study the cause of deviation between the model and observations focusing on the solar wind speed model which is used to specify the solar wind distribution on the inner boundary condition of SUSANOO-SW. We found that peculiar high speed structures around pseudostreamers, which must be formed by the Wang-Sheeley model [Arge and Pizzo, 2000], might be a cause of degradation of reproducibility.
In order to improve it, we take into account not only of the expansion factor but also of the magnetic intensity based on a theoretical work by Suzuki [2006]. I will quantitatively evaluate the performance of the new model, and discuss about what is needed to improve the predictability of solar wind model based on the comparison with the in-situ observation.

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