**R010-14**
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**9:00〜9:15**

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# Forecast of Geomagnetic Field Disturbances Using the Empirical Model for Space Weather

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The geomagnetic field disturbance, known as the indicator of the magnetospheric disturbance on the Earth, is one of the essential indicators for the space weather forecast. The magnetospheric condition strongly depends on the solar wind variation associated with, for example, coronal mass ejection and/or co-rotating interaction region. Particularly, strong solar wind inputs cause a drastic change of the ring current, resulting a magnetic storm that can be detected as a global change of magnetic field both in space and on the ground. The disturbance field (Dst) index, which is a parameter that indicates the magnitude of the ring current, is referred to understand the magnetospheric condition. In this study, we adapt the Dst index forecasting model based on two empirical models proposed in O'Brien and McPherron (2000) and Keika et al. (2015). We also attempt to estimate K-index that commonly used as the criteria for geomagnetic disturbance alerts in Japan.

For a few hours forecast, DSCOVR spacecraft data are used as the inputs. The estimated Dst index shows a good correlation with the observed Dst index, especially during when the solar wind has a strong southward interplanetary magnetic field (IMF). The comparison between observation and model indicates that the main contribution for our model is solar wind velocity and north-south component of IMF during the moderate magnetic storm. We also estimate K-index using the Dst index and compare with the K-index calculated from the geomagnetic field variation at Kakioka (called as Kakioka K-index). The estimated K-index can predict the disturbed condition of real magnetosphere, which timing corresponds to the Kakioka K-index. However, the estimated K-index overestimates comparing with Kakioka K-index. Since the Dst index is defined as an envelope of magnetic field variation observed at four low latitude stations, such error is likely to cause when Kakioka is away from the station where the maximum variation is detected. We also perform a few days forecast using SUSANOO-CME data as the inputs. The decrease of Dst index estimated from SUSANOO-CME data is reproduced though it is smaller than that of the observed Dst index.