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Prediction of the Auroral Electro jet index from the solar wind

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The auroral electrojet indices (AU, AL, AE) are a proxy of substorm as well as the auroral activity. The prediction of the these indices is important for the space weather forecast, because we can understand the basic mechanisms of the development of space environment, which may reduce possible space hazards. In this study, we develop a code to calculate the time variations of the AU and AL indices using the solar wind parameters based on the algorithm proposed by Goertz et al.(1993). Using the ACE measured solar wind data, we calculate the long-time variations of the AU index from 2000 to 2008. In order to evaluate the performance of the model, we calculate the skill score for each year. The largest skill score is found to be about 0.8. In this presentation, we report details of our code and how to improve the performance of the model, which has a strong dependence on the solar wind structure.

Keywords: AU index, AE index, AL index, Space weather