Ionospheric potential model for substorm development and the possibility of the AL index modeling

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An empirical potential model for substorm development has been constructed. DE2 potential data were analyzed, and the data were divided into five phases according to the growth of the AL index. Linearly relations between IMF Bz and the magnitude or latitude of the potential extreme point were identified, and with these relations a potential model was constructed. The development of the Harang discontinuity has been reproduced. To make the potential model more refined, we have evaluated the difference between the constructed model and observations. We present how this kind of difference can be incorporated in the model. We also show the calculated AL index using the potential model with the conductance model in the literature.

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