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## A nowcast model of the auroral oval and Kp index

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A numerical model of the aurora oval distribution and the corresponding Kp index has been developed. This model is based on an empirical model of the high latitude potentials we have recently constructed using nonlinear functions of the solar wind parameters, and on empirical relations between the precipitation boundary of the aurora particles, i.e., the equatorward latitude of the central plasma sheet and the Kp index. The obtained model of the auroral oval shows its dynamic nature, and the model Kp index, which can be produced from inputs of ACE solar wind parameters, IMF Bz, By, and Vsw shows a good correlation to the official Kp index, especially magnetic active times,  $Kp > 5$ , which has been thought to be difficult to predict in previous studies.

Keywords: auroral oval, Kp index, solar wind, magnetic storm, nowcast