Nonlin. Processes Geophys. Discuss.,
https://doi.org/10.5194/npg-2019-28-RC2, 2019

Nonlinear Processes in Geophysics
Discussions
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Interactive comment on "Prediction and variation of auroral oval boundary based on deep learning model and space physical parameters" *by* Yiyuan Han et al.

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Received and published: 21 September 2019

Review of manuscript, "Prediction and variation of auroral oval boundary based on deep learning model and space physical parameters", by Yiyuan Han et al.,

In this manuscript, authors have proposed a new automatic auroral oval boundary prediction model, based on deep learning method, using space physical parameters, and the location of auroral oval boundary at the previous moment. The proposed model is well explained with flow chart, and the procedure of training/testing of sufficient data sets supported by interpretation of results. A significant aspect of this model is, several probable parameters that can influence the variation of auroral oval have been

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fed as the inputs, which is a prerequisite to model complex system. More specifically, 18 space physical parameters and the 48 coordinates value of aurora oval boundary points at the previous moment were utilised for training/ testing, leading to the reasonable prediction of the position of poleward and equatorward boundaries at 24 MLTs. Identification of optimum choice of input parameters is a crucial aspect. In this work, it is shown that, different space physical parameters have different effects on auroral oval boundary, especially interplanetary magnetic field (IMF), geomagnetic indexes and solar wind parameters. Out of the input parameters used for training and testing the present model, authors can check how does the prediction capability of the model vary when inputs with least significance were removed. Or they can add some more probable parameters as inputs and observe the performance of the model. Finally, a combination of input parameters can be selected, based on which model performance is highest. This kind of a procedure will help to identify an optimum choice of input parameters, thereby establishing an input-output relation, and refine the existing model further. The authenticity of the proposed model can be improved further, by this way. Generally, the manuscript is well written, and the proposed model exhibits good prediction capabilities by delivering interesting results.

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