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

This manuscript describes an automatic auroral oval boundary prediction method by using a new deep learning model and shows some interesting results about the relationship between the location of auroral oval boundaries and several space physical parameters. A number of experiments are performed to test the proposed model and the connections between different physical parameters and the acquired auroral oval boundaries. This manuscript gives some new insights into the prediction of auroral oval boundaries variation.

Some comments and suggestions:

1. This manuscript designed a new model based on deep learning to construct the relationship between the physical variables and auroral oval boundaries. Did the authors consider some specific aurora forms (such as, substorms,transpolar arcs) when you did the experiments? Is it possible to construct the connection among other forms of data? Such as: the relationship between physical variables and auroral oval intensity in the process of a specific aurora event (for example: substorms, polar cap arc). Please give an expatiation.

2. As we known that the aurora dynamics are influenced by many factors, not only the variation of physical variables. Why the authors chose these 18 space physical parameters? Could you give an explanation? Whether this model can establish a connection between a specific aurora event and multiple forms of data, not only one parameter of data?

3. In the Introduction section, the authors described many previous studies. It seems to lack intrinsic and progressive connections among these previous studies. Could you rewrite them and make them more logically?

4. In section 3.3, please explain why the authors use the boundary data which calculated by 'Quadratic Equation' instead of the original boundary data to discuss the influence of space physical parameters on auroral oval boundary.

5. Some figures in this manuscript are not clear enough, and the readers may need high quality figures.

6. When an abbreviation of term first appears in the manuscript, the term should have a full name first. Such as MRSM, MLT-MLAT et al. Please check them.

7. The paper is easy to follow, but there are some writing mistakes or misleading descriptions which make the readers confused. Such as, Page 1, Line 24 "ex-tensive"; Page 2, Line 14 "be-tween"; Line 22, 26. Figure caption of Figure 5-7, should not be "left column", "right column". Please check and revise them. Please proofread this manuscript carefully.

I hope the authors recheck them and can take the above comments into account.