

Interactive comment on “Complex networks description of ionosphere” by Shikun Lu et al.

Anonymous Referee #1

Received and published: 14 November 2017

In recent decades, attentions on complex networks have been more and more paid to the field of geoscience as a powerful tool in investigations. Particularly, in the study of climatology and seismology. In this paper, the authors firstly introduce this method to construct a directed complex network to investigate the information flow in ionosphere. Some new results are gained that both the out-degree and in-degree distribution of the ionospheric network are not scale-free. The topological structure of the ionospheric information network is homogeneous. The spatial variation of the ionospheric network shows the connection principally exist between the neighbors in space, indicating that in ionosphere the information transmission is mainly based on the spatial distance. Since this is the first time that ionospheric data are used to construct such a network, the results are helpful in understanding some special characteristics of the ionosphere. The followings are a few suggestions to the authors as a reference: 1, Can authors make a simple comparison of results of this paper with other relatively similar earlier

C1

published networks like surface temperate data structured networks. Such comparison may provide some useful hints for the further development of the complex network construction 2, also, is it possible to explain the results of networks in the real ionospheric features 3, the data used in this paper only with one year's time span, and time resolution is two hours and ranges from -180° to 180° along the longitude and from -87.5° to 87.5° along the latitude with a revolution of 10 and 5 degree in longitude and latitude. Is the revolution affects the results? For example, in such a revolution, ionospheric equatorial anomaly, small-scaled irregularities are excluded, then how can we say the ionospheric network is not fractal?

Interactive comment on Nonlin. Processes Geophys. Discuss., <https://doi.org/10.5194/npg-2017-29>, 2017.

C2