REVIEW

Authors: Anatoliy Lozbin, Viktor Fedun, and Olga Kryakunova

Title: **«Complex analysis of the middle-latitude ionosphere parameters during the geomagnetic storm at Jan, 20, 2010 based on the DEMETER satellite data analysed using DIAS Software»**

The paper presents software for effectively processing data from the DEMETER satellite. The processing aims at searching for the effects in geospace that are caused by different sources. The study is urgent since the DEMETER satellite has collected a large amount of data requiring further processing.

The software performance is illustrated by some results of data processing.

The paper layout is quite successful.

The manuscripts need some improvements.

(1) The paper is of an advertising character since it contains few physical results. The storm effects are actually absent. The January 20, 2010 storm is described in the literature. The authors should compare their results with the results obtained by others (see, e.g., the results obtained by the incoherent scatter technique [Domnin, I. F., Emelyanov, L. Ya., Pazura, S. A., Kharytonova, S. V., Chernogor, L. F. Dynamic processes in the ionosphere during the very moderate magnetic storm on 20-21 January 2010 (In Russian) // Space Science and Technology. 2011. Vol. 17, no. 4. Pp. 26–40].

The authors should have considered a strong storm.

(2) The authors allegedly discovered the effects arising from the particle precipitation during the storm. However, precipitations from the inner radiation belt can only occur during strong storms. [Baker, D. N., Kanekal, S. G., Li, X., Monk, S. P., Goldstein, J., and Burch, J. L.: An extreme distortion of the Van Allen belt arising from the 'Hallowe'en' solar storm in 2003, 432, 878–881, https://doi.org/10.1038/nature03116, 2004.].

(3) The authors assert (line 10-15) that magnetic storms affect ionospheric parameters. This approach seems outdated. Magnetic and ionospheric storms, like atmospheric and electrical storms, are components of a single process, namely, a geospace storm (see, e.g, Chernogor L. F., Garmash K. P., Guo Q., Zheng Y. Effects of the Strong Ionospheric Storm of August 26, 2018: Results of Multipath Radiophysical Monitoring / L. F. Chernogor, K. P. Garmash, Q. Guo, Y. Zheng // Geomagnetism and Aeronomy. – 2021. – Vol. 61, No. 1. – Pp. 73–91; Chernogor L. F., Garmash K. P., Guo Q., Luo Y., Rozumenko V. T., Zheng Y. Ionospheric storm effects over the People's Republic of China on 14 May 2019: Results from multipath multi-frequency oblique radio sounding / L. F. Chernogor, K. P. Garmash, Q. Guo, Y. Luo, V. T. Rozumenko, Y. Zheng // Advances in Space Research. – 2020. – Vol. 66, Is. 2. – Pp. 226–242; Luo Y., Chernogor L. F., Garmash K. P., Guo Q., Rozumenko V. T., Zheng Y. Dynamic processes in the magnetic field and in the ionosphere during the 30 August–2 September, 2019 geospace storm. Annales Geophysicae. https://doi.org/10.5194/angeo-2020-57 .

(4) The authors mistakenly state that "… effect of radio transmitters on the ionosphere" (line 25). The ionosphere is actually affected by the radio emissions from the transmitter.

(5) It is necessary to expand the figure captions, to make them more informative.

(6) $K_{p\max}$ should be specified.

Recommendation: Return to authors for minor revisions

Sincerely,
Reviewer.