

Comments on the manuscript “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” by A. Lozbin, V. Fedun and O. Kryakunova.

The paper describes the software that may be useful for DEMETER satellite data processing and presents the case study using these data. This is an interesting article that I would recommend for publication after revision. The majority of my comments are minor.

General comments.

(1) My main recommendation is to state clearly whether the authors describe the software features or present the analysis of the particular magnetic storm effects on the ionosphere. Now it is confusing: the first part of the article seems to be a program manual and the second - a case study with a missing scientific focus.

I recommend to state clearly the aim and the tasks of the study (p.2 line 14). There is a lot of work done, which is much appreciated. The authors just need to put in “frame”.

(2) I have a doubt about the “DIAS” acronym. Up to my knowledge, it is widely used for European Digital Upper Atmosphere Server (DIAS) initiated in 2004. Please see the works of Belehaki et al. Probably, some clarification is needed here.

(3) The Acknowledgement of work of developers of the DEMETER satellite equipment is missed.

(4) Where the developed DIAS software may be accessed?

In case that the authors would like to present a full research study:

(5) p.11 line 1 and further: Why do you discuss the interplanetary parameter variations? Is it important for your analysis of the ionosphere state change? I recommend only a brief description - a couple of sentences with citing the appropriate works.

(6) What exactly can be concluded on the changes in the ionosphere by your analysis? Over what area?

(7) I would expect some references to the papers that already discussed the considered magnetic storm. What new was found?

(8) p.1 line 18. I would add that due to the fact that the satellite passes over the different parts of the Earth, it is impossible to take into account the diurnal variation of ionospheric parameters over some particular point of observation. The last is rather important when searching for the irregular parameter behaviour. I recommend discussing this in the text.

Minor comments.

I suggest replacing “*disturbances in the ionosphere*” with “ionospheric variations” throughout the text.

Please replace *UTC* with “UT” throughout the manuscript.

Please note, that first the term should be mentioned and then its acronym should be introduced, not otherwise. For instance, p.3 line 5: *ULF (Ultra Low Frequencies)* → Ultra Low Frequencies (ULF). Please revise carefully throughout the text.

Title: Please replace *Jan* with “January” and *Based on the* with “by”.

In general, the title is long and confusing. I recommend changing it according to the aim of the paper.

1-12: I am not sure that the *measurements* (these or that) are a *method*. These are two different concepts. I suggest calling them experiment/ obtaining data/ satellite measurements, but not a method.

1-19:

Man-made → artificial

Eliminate *during active period*

Eliminate *composition*,

1-20: *raw (raw)* - Eliminate repetition.

2-21: *Providing* → provide

2-1: Why limited? What else is needed except for the time, coordinates and value?

2-5: *In the of Scientific....*

The sentence is too large and difficult to follow. Please separate it into several sentences.

2-12:

Undoubtedly, that → It is known that

Eliminate *that*

2-22: *is devoted* → was

2-25: *Events* → hazards

2-29: *science payload* → scientific payload

2-30: Five instruments are mentioned by their acronyms. The acronyms must be introduced.

3-3: *Data from scientific in...*

Please eliminate this sentence as it repeats the said above.

3-10 and further: I am not sure I follow the idea. It is stated that the detector works in two regimes: for seismic regions and for the rest of the Earth surface. Is it correct? The authors probably meant that the detector was capable of measuring different ranges of energies. Please explain clearly.

3-25: *possibility of calculating the signal-to-noise ratio* → signal-to-noise ratio calculation

Subsection 3.1: Please indicate how the discussed files can be accessed. Downloaded from some web-page?

4-23: *Allow* → allows

5-11: *Also,* → In addition,

7-1: *There is possible to get a graph of* → It is possible to plot

7-11: *result of such analysis may be a pattern* – I am not sure I understand the meaning of this sentence. Please rephrase.

7-12: *NWC transmitter* - Please introduce the acronym and provide the details on the transmitter (transmitter network?). Where is the receiver?

14-2: eastward of the transmitter location?

9-4: *One more important* → Another

9-5: What do you mean by *physical map*?

10-2: I recommend explaining the meaning of the *right half-orbits* (what right or left half means) and what do you imply by choosing them.

The same for: 11-9.

10-5: *Storm at* → storm on

10-7:

maximum of Kp index was on 15-18 hours by UTC. → Kp reached its maximum value between 15 and 18 UT.
directions → magnetic field components (?)

11-1: If the authors use the data/information from some internet source, they should clearly state why and for what purpose. None web-page should be cited without a proper explanation about whose page is it and why the authors use its data/information.

12-4: On → by

12-4: *zone of aurora polaris at various altitudes*
Auroral zone? What latitudes do you mean?

12-5: *charge structures* - ?
May be replace this with “disturbances” or “irregularities”?

12-8: *half orbits* - Please explain where it is exactly.

12-9: *right* → lower ?

12-11:
The word *apparently* is repeated several times.
Eliminate *just*.

Figure 9: Please indicate with arrows the whistlers and the plasmospheric hisses in the figure

13-3: *magneto-conjugate point*
Magneto-conjugate point of what?

13-6 and further:
It is important over which latitudes the electron precipitations of these or that energies are registered. Please be more specific about what the observed precipitations mean for the ionospheric effects (geophysically).

14-17: width → latitude