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Interactive comment on "Comment on "Identification of the IMF sector structure in near-real time by ground magnetic data" by Janzhura and Troshichev (2011)" *by* Peter Stauning

Anonymous Referee #1

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This manuscript comment [Stauning 2020] addresses a paper by A. S. Janzhura and O. A. Troshichev titled "Identification of the IMF sector structure in near-real time by ground magnetic data" and published in Annales Geophysicae 9, 1491-1500, 2011 (subsequently referred to as [J & T 2011]).

As stated in the abstract of [J & T 2011]:

"A method is proposed to determine in near-real time the interplanetary magnetic field (IMF) sector structure (SS) effect on geomagnetic data from polar cap stations. [...] The

proposed simple method makes possible identification of the SS effect in the same near real-time regime as the derivation of the quiet daily curve and as level of reference for the polar cap magnetic disturbances in the calculation of the polar cap magnetic activity PC index."

The simple method described in section 3 uses 4 median values from the previous 9 days (n=1-3, 3-5, 5-7, 7-9) to fit a cubic spline and obtain a value for the current day (n=0). Although this is referred to as an "interpolation procedure", it is clearly extrapolation.

However, [Stauning 2020] asserts that several key results are actually obtained using post-event ("final") values based on daily medians smoothed over a 7-day interval centered on the day of interest. By definition this approach could not be applied in real-time. This would mean that [J & T 2011] did not prove the validity of their approach.

It should be noted that results in [J & T 2011] do show a clear connection between IMF sector structure and post-event ground magnetic data. They do not however directly address the usefulness of this connection for real-time monitoring as defined.

[Stauning 2020] addresses this issue by undertaking re-analysis based on extrapolation from the preceding 9-day intervals. Many results are significantly different in detail, although many general relationships are still evident. For example, linear correlation coefficients obtained by [Stauning 2020] from post-event analysis were in good agreement ($r \sim 0.95$) with the results presented by [J & T 2011]. In comparison, re-analysis with the "real-time" algorithm produced much lower correlations ($r \sim 0.7$).

If [Stauning 2020] has in fact discovered a significant defect in a paper with more than a dozen citations then some record of this should be published. A subsequent reply by the authors of [J & T 2011] would provide an opportunity to present additional re-analysis and determine how well their original thesis is supported in the light of new results.

Interactive comment on Ann. Geophys. Discuss., https://doi.org/10.5194/angeo-2020-53, 2020.