

## ***Interactive comment on “Polar substorm on 7 December 2015: pre-onset phenomena and features of auroral breakup” by Vladimir V. Safargaleev et al.***

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Reply to Referee #1 interactive comments on “Polar substorm on 7 December 2015: pre-onset phenomena and features of auroral breakup” by Vladimir V. Safargaleev et al.

...It is then speculated that the periodicity of 15 minutes in the dayside reconnection will excite global oscillations with the same period in the magnetosphere, which in turn could trigger reconnection through some instabilities. While it is not discussed why such instabilities would be susceptible to oscillations with this specific periodicity, or how these oscillations are transmitted from polar regions into the plasma sheet, one

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can not argue with the author' speculations.

- We indicate some instabilities as not the main but “one more possible” reason for substorm triggering (L425-428). In the cited papers by Roux et al. (1991) and Golovchanskaya et al. (2015) the conclusion regarding the substorm initiation via interchange or ballooning instabilities, respectively, was supported by satellite observations. Such satellite data are not available for the case considered in the present paper. In this respect we agree with Referee #1 comment that “one can not argue with the author' speculations” and remove the sentence from the text (L. 425-428).

Below are some comments and suggestion that the authors may chose to include or exclude: L15: "Some later" -> "Later, " L27: "The question is solving on the base of satellite observations" , rewrite L53: Define WTS L66: Check reference (missing L) L119: per second L151: relative to L157: "Thus, by the moment .." -> "At T0, BJN ...." L207: "IMF deflections through 15 minutes" - rewrite L218: "suppose" -> "speculate" L253: "With taking" -> "Taking" Also suggest to export figure 2 to a scalable format, also some of the labels are too small.

- We have considered these comments and made corresponding changes.

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Interactive comment on Ann. Geophys. Discuss., <https://doi.org/10.5194/angeo-2019-118>, 2019.

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