

General comments:

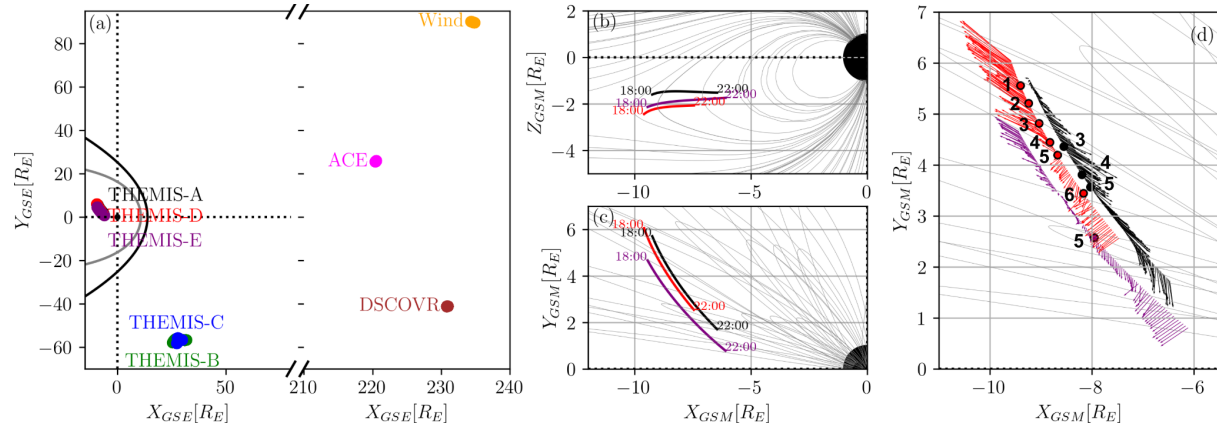
The manuscript provides detailed case studies of 4 bursty bulk flow events occurring on December 7, 2023 in order to determine the magnetotail-ionosphere coupling during these events and the space weather impacts of these events. The authors examine horizontal ionospheric currents, all-sky camera data, plasma measurements from THEMIS and Swarm, and ground magnetometer data from these intervals. They conclude that BBFs correspond to regions of counterclockwise vorticity and enhanced auroral activity in the ionosphere, highly localized alternating FAC structures, magnetotail dipolarizations, and ground magnetic disturbances that have the potential to drive GIC events. This manuscript is a valuable contribution to the field and this reviewer recommends publication following minor revisions to improve the clarity of the manuscript.

We appreciate the referee's comments, which helped us produce a better version of the manuscript. The response to each comment is indicated below in red.

Figure corrections:

Figure 1: Since this figure is referred to later in the manuscript to discuss By during BBF intervals in line 242, the reviewer recommends labeling the dots in panel d with the number of the relevant BBF interval.

Response: We have updated the figure and adapted the caption according to the changes.



[...], with the number next to each dot identifying the corresponding BBF interval. The BBF observed during Interval 5 was simultaneously detected by all three spacecraft.

Figure 2: The authors may consider separating panel d into one panel for AU/AL and one panel for SYM-H, since the two sets of parameters are determined differently and measure different kinds of activity.

Response: We updated Figure 2, and adapted the labels (d-f) according to the new version of Figure 2.

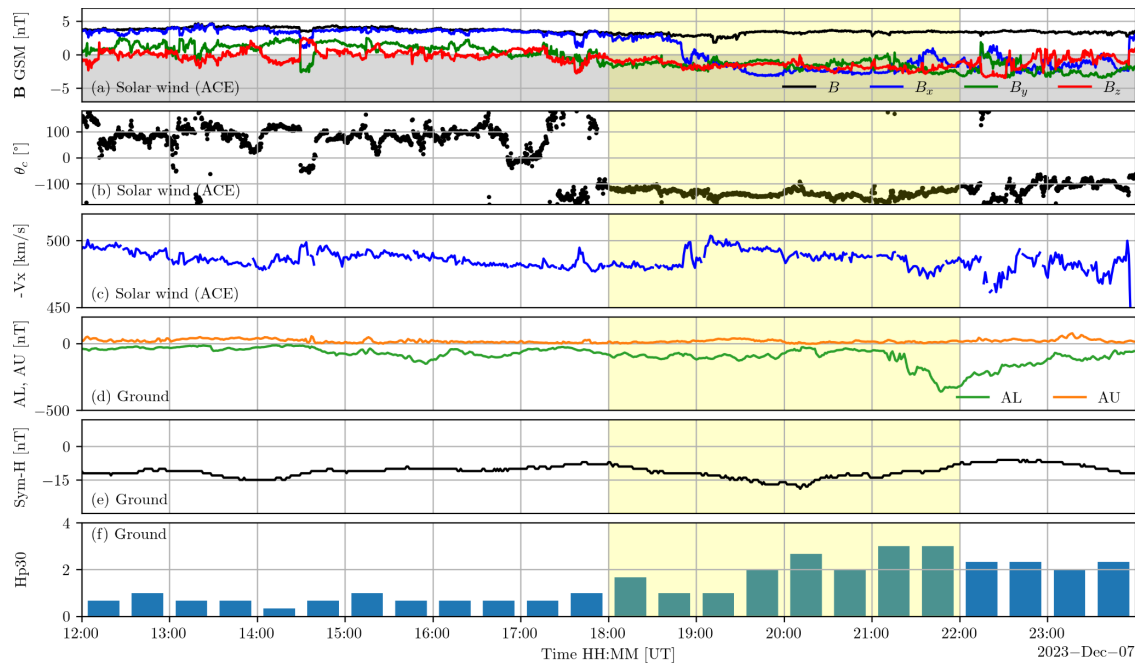
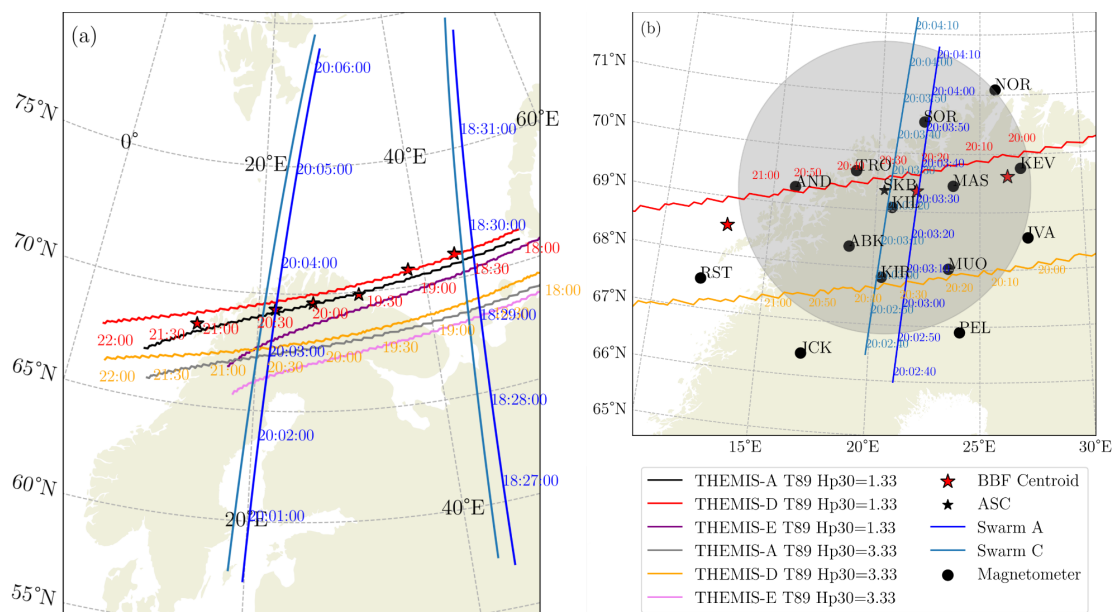


Figure 2 caption: “no time-shifted” → “no time-shift”

Response: Done

Figure 4: The inclusion of the BBF footpoints estimated from the Tsyganenko models make it difficult to identify the ground stations, centroid etc. and are already described in the text and included in later figures. The reviewer recommends removing these footpoints from this figure or including them as a separate figure in an appendix.

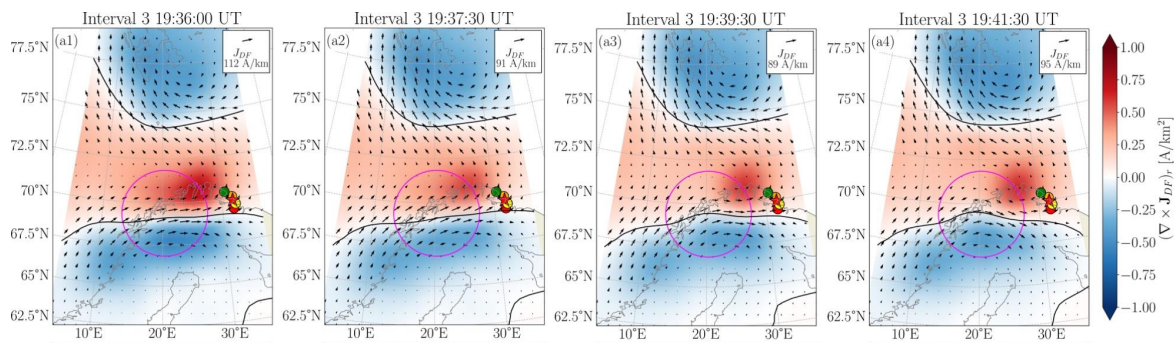
Response: We have updated Figure (b) showing only the BBF footprint centroid and have adapted the caption accordingly.



Figures 5-8, panels a: The BBF footprint centroid is difficult to see in panels a in Figures 5-8 and could be made bigger. The Tsyganenko footprints are not referred to in the text and not included in panels b in Figure 5. The reviewer recommends removing these footprints from all Figures 5-8 or including the footprints in Figure 5 panels b.

Response: We have increased the size of the BBF footprint centroid and the Tsyganenko footprints in Figures 5-8 panels (a). We have also included the all-sky camera field-of-view projected at 110 km altitude as a reference for panels (b). From this new version, we observe that the BBF footprints during Interval 3 are outside the ASC field-of-view, and this is the reason why the BBF footprint does not appear in Figure 5 panels (b).

Example panels a in Figure 5:



We have also adapted the caption of Figure 5 according to the implemented changes.

[...] The magenta circle in panels (a) indicates the ASC field of view projected at 110 km altitude. The red star marks the BBF footprint centroid computed from the Tsyganenko models, shown in dots: T89 (red), T96 (orange), T01 (green), and T04 (yellow).

We have also added the references in the main text in line 297:

[...] The BBF footprint centroid is marked with the red star, and the BBF footprints estimated from the Tsyganenko models are shown as colored dots: T89 (red), T96 (orange), T01 (green), T04 (yellow), TA15n (purple), and TA15b (magenta).

Figure 11, panels a-d: It is extremely hard to see the BBF centroid and footprints in these figures and the reviewer recommends making these bigger.

Response: We have increased the size of the BBF footprints.

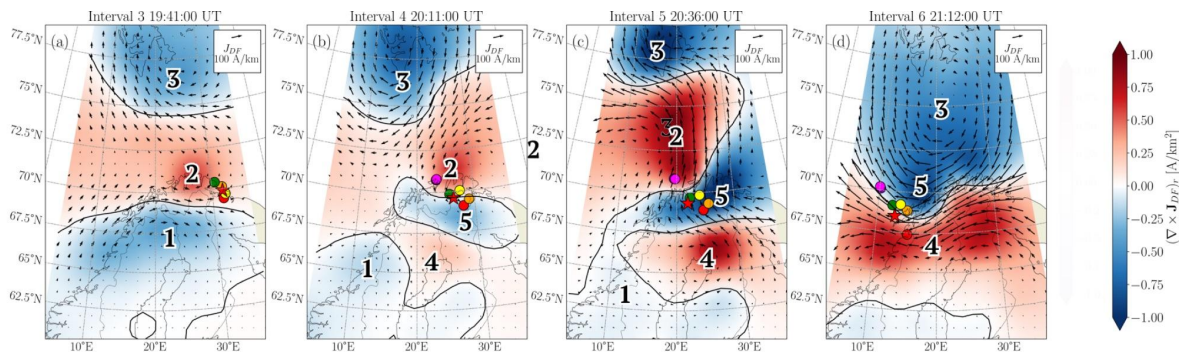
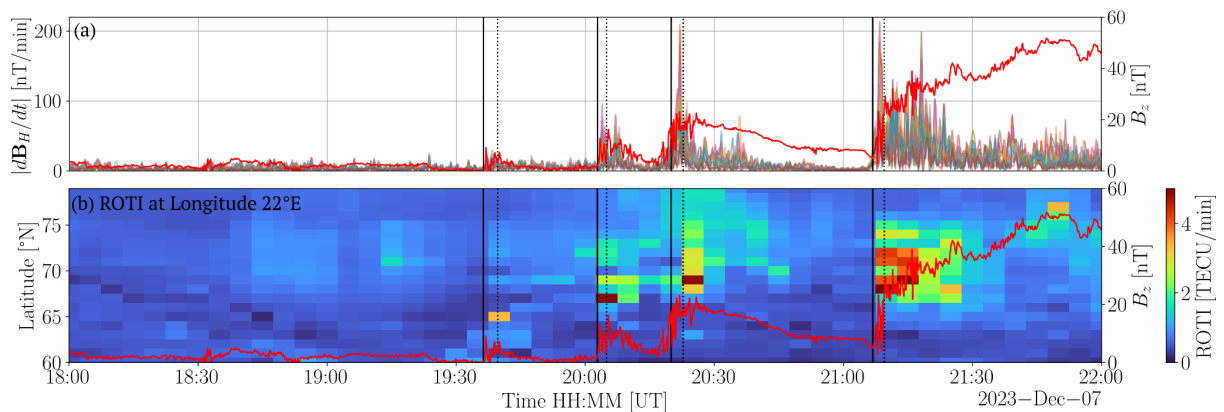


Figure 12: It could be helpful to include reference lines for the BBF events discussed in the text.

Response: We have updated the figure and its caption.



[...] The vertical lines indicate the beginning (solid) and end (dashed) times of the four BBFs intervals listed in Table 1.

Technical corrections:

Line 189: It looks like the IMF clock angle changes closer to 18:00 UT.

Response: Thank you for pointing this out. We have made the correction.

Line 226: Since the THEMIS-D BBF detection is not included in Figure 3 but is discussed in the text, it would be good to include in the figure or mention the time span of the BBF in the text.

Response: To be consistent with the comments from Referee #2, we have removed the paragraph containing Line 226. We also clarify that the THEMIS-D BBF detection is already included in Figure 3, shown as the red shaded intervals from George (2026) and the cyan shaded intervals from Feng et al. (2025).

Line 232: “throughout the interval” → “throughout the intervals”

Response: Done

Line 379: Do the authors mean to refer to panel a3?

Response: Thank you for pointing this out. The correct reference is indeed to panel (a3). We made the correction.

Line 406: Do the authors mean to refer to panels c and d where THEMIS D Bz is labeled?

Response: Thank you for pointing this out. The correct reference is indeed to panels (c) and (d). We made the correction.

Line 445: The reviewer believes the authors should be referring to 20:03:28 instead of 20:23:28.

Response: The reviewer is correct. The correct time should be 20:03:28. We made the correction.

Table 2 caption: "SuperMag" → "SuperMAG"

Line 462: "SuperMag" → "SuperMAG"

Response: We have included the correction

Line 546: The reviewer believes the authors mean that the largest perturbation occurs during Interval 6, while Interval 5 produced a comparable peak.

Response: The reviewer is correct. We have corrected the text.