

Interactive comment on “Comments on “Cavitons and spontaneous hot flow anomalies in a hybrid-Vlasov global magnetospheric simulation” by Blanco-Cano et al. (2018)” by Gábor Facsko

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The author would like to thank the Referee for the helpful and constructive comments and suggestions which helped to improve the manuscript. I agree with most of the comments from the referee.

The peaks are not always at 0 and 600 km/s. However there are two maxima in the young HFAs at the solar wind and the reflected particle populations. The velocity distribution functions in Figure 6 are not convincing at all. For HFAs the electron energy spectra would help to decide whether the event is young or mature (Wang et al., 2013). However, it is not possible when you are using a hybrid plasma simulation where the

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electrons are neutralising fluid. The wave activity in the HFA cavity could also help to decide the age of the events (Tjulin et al., 2008). However, nobody has studied the wave activity in the cavity of SHFAs. Hence, we have only Figure 6, and the double peaks are very faint there.

The SHFAs are not surrounded by shocks. However, at the edge of the phenomena the density and the magnetic field are increased. However, they should be observed as consequence of the expansion. These moving increases cause the anomalous flow (Parks et al., 2013).

The final conclusion is that the simulated phenomena were not SHFAs. However, the events could have developed into SHFA. These objects are so-called proto-SHFA, which is another category of the transient events.

References

- Parks, G. K., Lee, E., Lin, N., Fu, S. Y., McCarthy, M., Cao, J. B., Hong, J., Liu, Y., Shi, J. K., Goldstein, M. L., Canu, P., Dandouras, I., and Rème, H. (2013). Reinterpretation of Slowdown of Solar Wind Mean Velocity in Nonlinear Structures Observed Upstream of Earth's Bow Shock. *Astrophysical Journal*, 771(2):L39.
- Tjulin, A., Lucek, E. A., and Dandouras, I. (2008). Wave activity inside hot flow anomaly cavities. *Journal of Geophysical Research (Space Physics)*, 113:8113.
- Wang, S., Zong, Q., and Zhang, H. (2013). Hot flow anomaly formation and evolution: Cluster observations. *Journal of Geophysical Research (Space Physics)*, 118:4360–4380.

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