

Interactive comment on “Jets in the Magnetosheath: IMF Control of Where They Occur” by Laura Vuorinen et al.

Anonymous Referee #1

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This paper addresses the spatial distribution of magnetosheath jets as a function of the orientation of the interplanetary magnetic fields, using a combined THEMIS and OMNI data set. The paper is very well written and gives interesting results on this aspect of magnetosheath jets, which has not been studied in detail before. I have only some minor issues that I would like the authors to address or comment before publication.

1. Figure 1: How are the boundaries of the foreshock regions determined, specifically the angle of the foreshock boundary wrt the X axis?
2. page 4, lines 15-17: How exactly is the number of jets determined? For jets with a dynamic pressure marginally greater than the criterion a single jet may have a dynamic pressure that repeatedly goes above and then below this limit. are such occurrences counted as individual jets, or are they combined to one jet (similar to what is often done

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for bursty bulk flow events)? If not, this may skew the statistics and overestimate the number of jets with low dynamic pressure.

3. As can be seen from Figure 2, even for low cone angles part of the subsolar region of the bow shock is associated with the quasi-perpendicular shock. It would be good to get a number of how large a part of the bow shock is quasi-perpendicular for a few cone angles.

4. page 6, line 11: ‘We have used Xgipm-axis...’ should read ‘We have used the Xgipm-axis...’

5. page 7, line 3: ‘very high error bars’ should read ‘very large error bars’.

6. page 7, line 9-10: ‘with decreasing Ygipm, i.e. with decreasing theta_Bn’. This is not strictly true, since the angle also depends on Xgipm. Perhaps it would be instructive to plot the distributions in the ‘opposite’ sense as well, i.e. for a few ranges of Ygipm plot the number of jets per hour as a function of theta_Bn, although you do get a sense of this from Figure 4.

7. page 7, line 11-13: The authors mix the denotions ‘quasi-radial IMF’, ‘quasi-parallel shock’, ‘high-cone angle IMF’, and ‘quasi-perpendicular shock’. Do you consider there to be a one-to-one correlation?

8. page 8, line 7: ‘clear visible’ should read ‘clearly visible’.

9. page 9, line 7: ‘could be easily’ should read ‘could easily be’.

10. page 9, line 30: ‘jets are thought to be able to also suppress reconnection’. Please elaborate or give a reference.

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