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Comment on angeo-2021-17

Anonymous Referee #1

Referee comment on "Reflection of low-frequency fast magnetosonic waves at the local two-ion cutoff frequency: observation in the plasmasphere" by Geng Wang et al., Ann. Geophys. Discuss., <https://doi.org/10.5194/angeo-2021-17-RC1>, 2021

The paper looks at an interesting case study of the reflection of magnetosonic waves in the radiation belts observed by the Van Allen Probe satellites when in close proximity to each other, allowing for a detailed study of the event. The authors generally explain the observation clearly and perform ray tracing simulations to demonstrate the processes. The results of the paper are interesting and give incite into the propagation of magnetosonic waves.

My only substaintial concern with the work in the paper is that the satellites have significant L^* separation during the event on the 20th July 2015, it is unclear how the authors determined that the observations are of the same magnetosonic waves. The analysis of this event is also fairly limited in comparison to the rest of the paper and potentially does not add to the paper.

In line 108, the authors say that the waves in Region III observed by Probe A are westward, however it is difficult to see that directly in Figure 2f as there appears to be similar amounts of blue and red. Is this determined by a power weighed average? If so, this could be included in the text.

Figure 4 panels (e)-(h), Figure 4 panels (k)-(p) and Figure 4 panels (s)-(x) are very small when printed and hard to read. I would suggest having these are a separate figure.