

## ***Interactive comment on “Van Allen Probes observation of plasmaspheric hiss modulated by injected energetic electrons” by Run Shi et al.***

**Run Shi et al.**

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We thank both reviewers for their careful reading of the manuscript and valuable comments for improvements. We have made point-by-point responses to the detailed comments by both reviewers indicated in the blue color, and included a new version of the manuscript with highlighted changes.

Responses to Reviewer #1:

Evaluation: The authors present an interesting and compelling study showing the modulation of hiss wave intensity and injected electron flux by ULF waves observed by Van Allen probe B near the dayside. The results provide important evidence that the hiss intensities observed were likely generated by local amplification in the outer

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plasmasphere. In contrast, the hiss emissions observed by Van Allen probe A, at lower L shells, were not associated with electron injections and were primarily modulated by plasma density. The Van Allen probe A measurements suggest that the hiss observed deep inside the plasmasphere may have propagated from higher L shells. This is a very good and comprehensive study and I have no hesitation in recommending it for publication in *Annales Geophysicae*. I have a small number of minor comments that the authors may wish to take into account when preparing the next draft of their paper.

Reply: The authors would like to thank Reviewer #1 for the positive evaluation and helpful comments to improve the paper quality. We have made the following responses to the reviewer's specific comments.

Minor Comments: Line 49. The authors should consider including references to Meredith et al. [2007, 2009] who also demonstrated the importance of plasmaspheric hiss in the loss of energetic electrons in the plasmasphere  
References: Meredith, N.P., Horne, R. B., Glauert, S. A., & Anderson, R. R. (2007), Slot region electron loss timescales due to plasmaspheric hiss and lightning generated whistlers, *Journal of Geophysical Research*, 112, A08214, doi:10.1029/2006JA012413  
Meredith, N. P., Horne, R. B., Glauert, S. A., Baker, D. N., Kanekal, S. G., & Albert, J.M. (2009), Relativistic electron loss timescales in the slot region, *Journal of Geophysical Research*, 114, A03222, doi:10.1029/2008JA013889

We thank the reviewer for the suggestion. We have added these two references in the manuscript (see Line 49 of the revised manuscript with highlighted changes).

Line 200. Please explain in a little more detail why the modulation of the low energy electrons is highly relevant to the presence of ULF waves.

We thank the reviewer for the suggestion. We have added the discussion in the manuscript (see Lines 209-212):

"These low energy electrons may be accelerated by the ULF waves during the first

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half cycle and then decelerated so that there is no total energy gain. This mechanism was also demonstrated in the drift-resonance theory in which the peak electron fluxes should have a  $180^\circ$  energy shift [Southwood and Kivelson, 1981].”

Please also note the supplement to this comment:

<https://www.ann-geophys-discuss.net/angeo-2018-2/angeo-2018-2-AC1-supplement.pdf>

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Interactive comment on Ann. Geophys. Discuss., <https://doi.org/10.5194/angeo-2018-2>, 2018.