Annales Geophysicae Discussions

Ann. Geophys. Discuss., referee comment RC1
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Comment on angeo-2021-57

Anonymous Referee #1

Referee comment on "Magnetospheric response to solar wind forcing: ultra-low-frequency wave–particle interaction perspective" by Qiugang Zong, Ann. Geophys. Discuss., https://doi.org/10.5194/angeo-2021-57-RC1, 2022

As a review paper that was invited as part of the author's EGU Hannes Alfvén Medal, this preprint summaries current understanding and recent advances made by the author's team from Peking University on magnetospheric response to solar wind forcing from the perspective of ULF wave – particle interaction. The solar wind forcing mainly includes interplanetary shock and/or solar wind dynamic pressure pulses. The manuscript is mainly focused on poloidal mode wave interaction with radiation belt energetic electron, ring current ions and plasmaspheric electrons. Generalized theory of drift and drift-bounce resonance with growth or decay localized ULF waves has been discussed and used to explain in situ spacecraft observations. Recent advances on nonlinear and multiple drift/drift-bounce resonance have also been discussed. The manuscript is generally well written and organized with clear presentation, the results described are of interest. I would recommend the paper for publication after my comments are addressed.

Please also note the supplement to this comment:
https://angeo.copernicus.org/preprints/angeo-2021-57/angeo-2021-57-RC1-supplement.pdf