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Interactive comment on "BD-IES Observation of Multi-Period Electron Flux Modulation Caused by Localized Ultra-Low Frequency Waves" *by* Xingran Chen et al.

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The manuscript is on a case study of multi-period electron flux modulation observed with energy range of ∼60 to ∼200 keV using in-situ BD-IES instrument of a Chinese navigation spacecraft. Following the standard understanding of ULF pulsation interactions with electrons, the manuscript tries to address this interaction as the primary cause for the flux modulation considering the observed delay time between the oscillating signatures of the electron fluxes among different energy ranges. Thereafter, the manuscript tries to offer a more generalized formalism by inclusion of the typically-neglected term in the theory which is Betatron acceleration. The manuscript was not

very easy to review since it has a considerable amount of mathematical equations. The reviewer followed and rederived all the math and mathematical relations presented in the manuscript. The manuscript managed to show analytically the difference between the conventional and the more generalized calculation results. The figures are clear and inclusive. There are a few serious ambiguities and typos in the manuscript as well as one miss-calculation that needs to be addressed/resolved since of which might lead to different results and conclusions. The authors are required to be more specific about which parts of their reasonings, assumptions and calculations are originally developed for the first time here by themselves and which parts they are borrowing the ideas from by including proper references when needed. The reviewer also tries to give suggestions and references to make some of the reasonings completer and more related to the main context.

Overall, the ideas and methods presented in this paper could be important enough for publication; however, there are certain issues in both scientific content and presentation that ought to be dealt with first before the reviewer can decide and suggest the manuscript for publication. The reviewer categorized his review and comments (attached, please find them) into three classes: comments on science, comments on figures, and minor comments. The reviewer hopes the authors find them helpful and informative.

Please also note the supplement to this comment:
https://www.ann-geophys-discuss.net/angeo-2019-139/angeo-2019-139-RC1-supplement.pdf

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