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The study of ULF pulsation driven by the KH instability using a next generation M-I coupling simulation model

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ULF pulsation plays an important role in electron acceleration of outer radiation belt. One of the ULF generation mechanisms is an excitation due to KH instability at the magnetopause. Claudepierre et al. [2008] reported the ULF pulsation following the KH instability using a global MHD simulation model. Our next generation magnetosphere-ionosphere coupling global MHD simulation model reproduced the ULF pulsation at the magnetosphere and the ground following the KH instability because the resolution is improved. In this study, we have done the spectral analysis to ULF pulsation at the magnetosphere and ground. We drove the simulation changing the solar wind velocity of 800 km/s, 600 km/s, and 400 km/s. we made the spatial distribution of the integrated ULF wave power at the equatorial plane. In the results, we found that the integrated ULF wave power and the peak frequency depend on the solar wind velocity. The integrated ULF wave power is distributed lying on 2-3 layers at the magnetopause. These features are consistent with the results of Claudepierre et al. [2008]. We also found that there is the region of the strong ULF power, which seems to propagate form KH instability, at L= 8 Re in the night side in the case of northward IMF and the solar wind velocity of 800 km/s. In this lecture we will report the results of the detail analysis.

Keywords: ULF pulsation, KH instability, global MHD simulation