R006-P25
ポスター 1：11/25　AM1/AM2（9:15-12:35）

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Non-uniform excitation of storm-time Pc5 ULF waves in the inner magnetosphere: Van Allen Probes and Arase observations

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Storm-time Pc5 ULF waves can be generated by the wave-particle interaction with ring current ions in the inner magnetosphere. Since Pc5 waves can drive the radial diffusion of radiation belt electrons, understanding the excitation of Pc5 waves is a key issues in the study of the inner magnetosphere. Southwood [1976] proposed that the drift-bounce resonance was a candidate excitation mechanism of ULF waves. However, where and how storm-time Pc5 waves are generated are still open to discussion. Recently, Yamakawa et al. [2025] investigated the excitation of Pc5 waves observed by GOES satellites based on the GEMSIS magnetosphere-ionosphere coupled model and simulation results qualitatively reproduced the observed Pc5 waves. Previous simulation studies have shown that wave properties such as wave frequency and azimuthal wave number are not uniform but different at different locations [Yamakawa et al., 2019; 2020]. The purpose of this study is to investigate what causes non-uniform excitation of storm-time Pc5 waves in the inner magnetosphere based on multi-spacecraft observations.

This study focuses on the magnetic storm on 27 February 2018. To investigate ULF waves excited by ring current ions, magnetic field and proton flux data of RBSP-A (EMFISIS and RBSPICE) and ERG (MGF and LEPi) were used. During the early recovery phase of the storm, poloidal Pc5 waves (2-4 mHz) were observed outside the plasmasphere simultaneously by RBSP-A and ERG. Results suggest that wave frequency is similar between the two spacecrafts. However, using the ion sounding technic, we find that the azimuthal wave numbers are different: -60 for ERG and -20 for RBSP-A (both westward propagation). The drift resonance condition is well satisfied for both spacecrafts and resonance energy is estimated to be 10-25 keV/q for ERG and 70-100 keV/q for RBSP-A. We consider that the difference of the azimuthal wave number is caused by the difference of resonance energy. We will also report on the instability condition of the excited ULF waves and future plans about the simulation of ULF waves during this storm.