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ポスター 3 : 9/26 AM1/AM2 (9:00-12:30)

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Analysis of plasma waves observed by LFAS/WFC onboard the SS-520-3 sounding rocket

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It is known that ions in Earth's upper atmosphere are accelerated and escape into space at the polar cusp region. The SS-520-3 sounding rocket was designed to understand the acceleration mechanism of escaping ions. Previous rocket experiments and satellite observations suggest that broadband extremely low frequency (BBELF) waves are involved in ion acceleration. For this reason, SS-520-3 is equipped with plasma wave and DC electric field instruments called the Low-Frequency wave Analyzer/ System (LFAS). The LFAS has two types of receivers, WaveForm Capture (WFC) and Electric Field Detector (EFD). The frequency range of the WFC is 10 Hz to 10 kHz, and that of the EFD is DC to 400 Hz. Both receivers obtain the electric field from two orthogonal pairs of dipole electric sensors. Due to telemetry limitations, the WFC performs single-channel waveform observations until 330 s after launch, and dual-channel observations between 330 s and 630 s, when the rocket is expected to be near apex height.

The SS-520-3 sounding rocket was successfully launched on November 4, 2021 from Ny Alesund, Spitsbergen, Norway. Two LFAS receivers operated successfully during the flight. However, due to sensor problems, two of the four sensor elements were not deployed and one was deployed later than planned. As a result, the LFAS observed the electric field in an orthogonal monopole configuration. From the observation result of the WFC, we found waveforms similar to the previously reported BBELF waves. However, the WFC waveform showed a large-amplitude, low-frequency, periodic noise originating from the undeployed antenna. We attempted to reduce the effect of noise by using EFD single probe data to analyze BBELF in more detail. In the presentation, we will show the detailed analysis result of the WFC observation data.