R005-P07
ポスター 3 ：11/6　AM1/AM2 （9:00-12:30）

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Broadband electric field fluctuations observed by LFAS/WFC onboard the SS-520-3 sounding rocket

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The SS-520-3 sounding rocket campaign is planned to investigate the escape of ionospheric ions from the cusp region. It has been suggested that the ion escape is originated from the ion acceleration/heating by plasma waves in the direction perpendicular to the ambient magnetic field. The broadband extremely-low-frequency (BBELF) waves have been proposed as a candidate to cause the ion acceleration/heating. The SS-520-3 sounding rocket is equipped with instruments to measure plasma and electromagnetic fields to reveal the mechanism for the ion acceleration/heating by plasma waves. Low-Frequency wave Analyzer System (LFAS) is developed to measure the BBELF waves during the flight of the sounding rocket. LFAS consists of two pairs of dipole electric field sensors in the rocket spin plane and two different receivers which cover the different frequency ranges. WaveForm Capture (WFC) measures electric fields in the frequency range from 10 Hz to 10 kHz with a sampling rate of 40 kHz. Because of the telemetry limitation, waveforms of two dipole sensors are available for 300 seconds. The data acquisition is programmed to start 330 seconds after the launch of the rocket so that the observation covers well near the apex height, where the BBELF waves are expected to be present.

The sounding rocket was launched at 10:09:25 UT on 4th November 2021 during a severe geomagnetic storm, reaching its apex height of 742 km at 489 seconds after the launch. Two electric field waveforms were successfully obtained by WFC for 300 seconds although the failure of the electric field sensor extension results in the orthogonal monopole sensor configuration. Analysis of the waveforms obtained by WFC shows that broadband electric field fluctuations are observed after the rocket reaches the apex height. The waveforms of the fluctuations are quite similar to those of BBELF previously reported [Wahlund+, 1998]. Utilizing the orthogonal monopole configuration, the interferometry technique can be applied to the waveforms to deduce the phase velocity and wavelength of the waves. In the presentation, we will show an overview of the WFC measurements and the initial results of the interferometry analysis.