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PEM031-P12

Room:Convention Hall

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Low energy electron observation by LEP-ESA on Norwegian sounding rocket ICI-3

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There exists large-scale plasma convection in the high latitude ionosphere such as two-cell pattern. Moen's group in Norway found the existence of Reverse Flow Events (RFEs) where plasma flow is opposite to the background convection pattern by EISCAT Svalbard Radar. RFEs are ~100-200 km wide east-west elongated channels that have an average life time of ~18 minutes. On the other hand, coherent HF radars obtain backscatter echoes from field-aligned plasma irregularities of decametre scale length. The strong coherent HF backscatter echoes are a well-known characteristic of the polar cusp. Although there exist several candidate processes including gradient drift instability, the generation mechanism of backscatter targets has not yet been agreed upon. The RFE phenomenon may be a very important facilitator of HF backscatter irregularities in the cusp ionosphere. Since the Reversed Flow Events (RFEs) are relatively long lived and do not move much in latitude during their lifetime, they are ideal as target for a rocket investigation. In order to prove the hypothesis that the RFE phenomenon plays an important role in plasma irregularity formation, ICI-3 sounding rocket experiment was proposed. ICI-3 will be launched in December 2011 from Ny Alesund, Svalbard, Norway. The main objective of ICI-3 is to obtain a better physical description of instabilities and wave phenomena driven by the RFEs in the winter cusp ionosphere. We are now preparing low energy electron energy spectrometer LEP-ESA for ICI-3 sounding rocket. LEP-ESA measures the electron distribution function in the energy range between 10eV and 10keV with time resolution as high as 11msec. We will report the design of LEP-ESA and its performance based on the results obtained by calibration experiment. We will also report the observation results obtained by the similar low energy electron analyzer on ICI-2 sounding rocket that was launched into cusp region in December 2008.