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B 会場 ： 11/26　PM3（16:40-18:25）
16:55〜17:10:00

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Space plasma precipitation and repelling processes by field-aligned electrostatic potential in auroral arc and hole

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Electric fields along local magnetic field line are one of effective mechanisms for accelerating space plasmas, as represented by the cases of neutron stars and planetary auroras. In the terrestrial polar regions, anti-earthward electrostatic fields along geomagnetic field lines can accelerate electrons in space plasmas into the Earth's upper atmosphere, generating bright and dynamic auroras characterized by arcs, curtains, curls, etc. One of the acceleration mechanisms producing "inverted V"-shaped features in energy-time/latitude distributions of precipitating auroral electrons, as observed in low-altitude space missions, is due to anti-earthward parallel electrostatic fields. The field-aligned electrostatic potentials, ranging from tens of volts to tens of kilo volts, are a consequence of the dynamo process generated in the dynamically changing magnetosphere. Our satellite instruments observed clear ion flux depletion in the energy range corresponding to localized field-aligned electrostatic potential above the satellite, which was coincidental with the electron precipitation forming the inverted-Vs. With advanced instruments onboard a microsatellite in low-altitude polar orbit, we detected recurring ion precipitation signatures accelerated by earthward parallel electrostatic fields, coinciding with electron flux depletion in the energy range smaller than the electrostatic potential. These precipitating ion signatures were observed in aurora-void regions, which we call "auroral holes" here, a conception newly defined after "coronal hole" of the Sun. These signatures provide persuasive double clues for the earthward electrostatic fields that accelerate ions toward the Earth and prevent electrons from penetrating the upper atmosphere although results in the past satellite missions might show the similar signatures.