R006-P04
ポスター１：11/4　PM1/PM2 （13:45-18:15）

#今城　峻 [1), 三好　由純 [2), 風間　洋一 [3), 浅村　和史 [4), 篠原　育 [4), 塩川　和夫 [2), 笠原　禎也 [4), 笠羽　康正 [5), 松岡　彩子 [1),Wang　Shiang-Yu[3),W. Y. Tam　Sunny[3), 田　采祐 [2), 中村　紗都子 [2), 小路　真史 [2), 北原　理弘 [6), 寺本　万里子 [7), 栗田　怜 [1), 堀　智昭 [2)
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Precipitation of auroral electrons accelerated at very high altitudes: Arase satellite observations

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The Arase satellite observed precipitation and loss of auroral electrons accelerated from the high altitude above ˜6 Re geocentric distance (32000 km altitude) during 5:50-6:00 UT on September 16, 2017. Downgoing electrons had a clear peak in phase space density at an energy of ˜1 keV, i.e., a monoenergetic distribution, implying an acceleration caused by a parallel potential difference. During the event, the fine channels of the low-energy particle experiments – electron analyzer (LEPe) onboard Arase looked at pitch angles within ˜5 degrees from the ambient magnetic field direction, and thereby have observed the detailed distribution of electron flux near the energy-dependent loss cone hyperbola. Upgoing electrons along the field line show an energy-dependent empty loss cone, which is wider in angular width for lower energy electrons. The observed width of the loss cone is consistent with that estimated from the energy of observed upgoing ion beams, corresponding to the potential drop below the satellite. By contrast, the downward loss cone was filled with downgoing electrons. These distributions near the loss cones of both downward and upward sides indicate that downgoing electrons that have been accelerated above the satellite precipitated and then lost into the atmosphere. The field-aligned current (FAC) density carried by net downgoing electrons inside the loss cone was estimated to be ˜5 nA/m2, corresponding to ˜1.2 microA/m as mapped at 100 km altitude, which is a typical value of FAC above auroral arcs. Upgoing electrons just outside the empty loss cone had energies higher than that of accelerated downgoing electrons, which fact indicates that accelerated downgoing electrons were further heated at lower altitudes and then came back to the satellite position. In addition to an electric field reversal and magnetic field deflection on a time scale of the event period (˜10 minutes), the satellite also observed solitary-wave-like electric field variations and associated magnetic field deflections of sub-second time scale in association with beams. We discuss the acceleration mechanism and the structure of the acceleration region on the basis of the observational results, including physical processes at higher altitudes.