

One-to-one correspondence between relativistic electron precipitation and pulsating aurora observed on 27 March 2017

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Recent studies of pulsating auroras (PsA) suggest that energetic electrons with energies up to several hundred keV precipitate into the atmosphere as a result of pitch angle scattering by whistler mode chorus waves. In this paper, we report correlation between PsA and EEP for the first time during recovery phase of substorms on 27 March 2017. EEPs were detected by subionospheric propagation of VLF radio waves. PsA was observed by the THEMIS all-sky imagers. We found one-to-one correspondence between pulsations of auroral intensity above the radio propagation path and perturbation of the received radio signal when PsA occurred on the path. The VLF perturbation showed short recovery time of 2 seconds. The recovery time reflects relaxation time of the ionization and strongly depends on the stopping altitude of the precipitating electrons. The short recovery time required the stopping altitude of 50-60km and indicates that PsA accompanied relativistic electron precipitation.