

Electric field oscillation behind pulsating aurora

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We present, for the first time, oscillation of electric field possibly associated with the occurrence of pulsating aurora. In November 2005 and September 2006, simultaneous campaign-based measurements of pulsating aurora were conducted over Iceland with an all-sky TV camera (ATV) at Tjornes (66.20N, 17.12W) and SuperDARN radar at Pykkvibaer (63.77N, 20.54W). During two intervals within these campaigns, pulsating aurora was observed with ATV at Tjornes in the morning side, whose frequency was 8 sec during the first event and 15 sec during the second event. In both intervals, quasi-periodic oscillations were identified in the Doppler velocity of the radar backscatter co-located with the pulsating aurora, whose amplitude was approximately 100 m/s. The period of the velocity fluctuations is the same as those of the pulsating aurora. We suggest that these oscillating Doppler velocities are driven by polarization electric field generated through charge accumulation at the edges of the electron density enhanced region caused by the occurrence of pulsating aurora.