

The pulsating aurora of January 27, 2017 as observed by e-POP, NOAA spacecraft, and ground assets

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The Cassiope/e-POP (now also known as Swarm-E) Canadian scientific satellite's Fast Auroral Imager observed pulsating aurora with its infrared camera in two passes over North America on January 27, 2017. On one of these passes the Radio Receiver Instrument was also operating. The ground path of NOAA-19 was nearly coincident geographically with that of e-POP, although offset slightly in time. The most relevant ground instrumentation was the THEMIS ASI array which showed the pulsating aurora with 3 second cadence, and VLF receivers at Athabasca and Kapuskasing of the PWING project led by Nagoya University, and University of Calgary's ABOVE VLF array. Both FAI and ground cameras show a distinct poleward border to the pulsating aurora, which lay between magnetic latitudes of approximately 64° and 68°. The MEPED instrument on NOAA-19 showed broad maxima in electron precipitation in the 40 and 130 keV channels, with distinct peaks in the loss cone electrons at several latitudes within the pulsating aurora zone. Chorus emissions were also observed in the VLF during the event. The footpoints of THEMIS A, D, and E were slightly poleward of the pulsating aurora when it was most active. A lack of wave activity there suggests that the mechanisms generating pulsating aurora were tightly confined to the region within about 10 Re of the Earth, which is consistent with where filled loss cones were observed by NOAA-19.

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