

# Postmidnight purple auroral rays and longitudinally-wide Pc1 pulsations observed at the CIR-associated solar-wind density enhancement on March 21, 2017

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Corotating Interaction Regions (CIR) associated with the high-speed solar wind from solar coronal holes are one of the outstanding structures in the solar wind that can cause geomagnetic storms. This paper reports two unique features, i.e., postmidnight purple auroral rays and global Pc1 geomagnetic pulsations, observed at the beginning of the CIR storm of March 21, 2017, based on the first campaign observation of our new (PWING) longitudinal ground network with the Arase satellite. The purple auroral rays were observed at ~0315-0430 UT (~03-04 magnetic local time) in the northeastern sky at Husafell, Iceland (magnetic latitude: 64.9°N). We suggest that the entry of high-density solar-wind plasma into the magnetotail caused the purple auroral rays in the sunlit ionosphere. The Pc1 geomagnetic pulsations at frequencies of 0-0.5 Hz were observed after ~00 UT over a wide longitudinal range of 13 hours of local times from midnight to afternoon sectors at subauroral latitudes associated with the CIR arrival.

Keywords: geomagnetic storm, Corotating Interaction Region (CIR), purple auroral ray, Pc1 geomagnetic pulsation