Multi-event analysis of SAPS Wave Structures observed by the SuperDARN Hokkaido Pair of radars

Nozomu Nishitani\textsuperscript{1}, Tomoaki Hori\textsuperscript{1}, and Mariko Teramoto\textsuperscript{2}

\textsuperscript{1}Institute for Space-Earth Environmental Research, Nagoya University, Nagoya, Japan (nisitani@isee.nagoya-u.ac.jp, tomo.hori@nagoya-u.jp)

\textsuperscript{2}Kyushu Institute of Technology, Japan (teramoto.mariko418@mail.kyutech.jp)

The SuperDARN Hokkaido Pair (HOP) of radars data with special operation modes are used to study the wavy variations of plasma flow embedded in larger-scale, fast flow structures at subauroral latitudes (SAPS). Because of the limited number of examples studied so far, their generation mechanism is not fully understood yet. In this paper we focus mainly on the events on Sep 08, 2017 and Aug. 26, 2018. Both events occurred near the peak of large geomagnetic storms. These events were registered by the SuperDARN radars with higher temporal resolution (3 and 12 seconds respectively) camping beams. Using both camping beam data and 2-dimensional data (with 1 to 2 min temporal resolution) enable us to examine the period, wavelength and propagation speed of these wave structures. In addition, using the data with the new fitting algorithm (fitacf Ver. 3) we have more extended coverage of the echo regions. We notice that both events were observed during geomagnetic storms (minimum Dst: -124 nT and -174 nT) and the wave structures have limited spatial extent in magnetic local time. On the other hand, there are several differences between these events such as period, propagation speed and geomagnetic latitude. Their possible generation mechanisms will be discussed.