

## Statistical study of Ionospheric Conductivity (SZA) Dependence of the SAPS using the SuperDARN Hokkaido East HF Radar

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In this study, we investigate characteristics of the subauroral polarization streams (SAPS), focusing on the solar zenith angle(SZA) dependence using the Super Dual Auroral Radar Network (SuperDARN) Hokkaido East radar, National Oceanic and Atmospheric Administration (NOAA) Polar Operational Environmental Satellites (POES) system and Meteorological Operational Satellite Program of Europe (MetOp) system data. The time span for the present study is from 2008/1/10 to 2016/12/31, which contains over 3180 days, and we limited the time range of the analysis to 3-8 UT (12-17 LT). We found 60 SAPS events over seasons except for summer, and for each event we examined the SZA and the peak Line-of-sight velocity observed in the SAPS, in order to identify the threshold of the possible SZA and illuminated ionospheric altitude for SAPS to be generated. To the best of our knowledge, this is the first detailed study of SAPS-associated SZA. As a result of the statistical study, we find that SAPS tend to appear when the SZA is larger than 98.5 degrees, and that the minimal threshold of illuminated ionospheric altitude for SAPS occurrence is about 100 km, which is near the altitude of the peak of Pedersen conductivity. This result suggests that the Pedersen conductivity plays an important role in the generation of SAPS. We should take into account the effect of HF propagation geometry, and EUV absorption in the atmosphere. We also need to study inter-hemispheric conjugacy of SAPS using the SuperDARN Buckland Park HF Radar whose location is roughly conjugate to SuperDARN Hokkaido East HF Radar, in order to study further the conductivity dependence.