R005-16
B 会場 ：11/5　AM1 （9:00-10:30）
09:00〜09:15

#チャクラボルティ　芝地 [1)], 西谷　望 [2)],Baker　Joseph. B.H.[3)],Ruohoniemi　John M.[4)]
[(1] バージニア工科大学,[(2] 名大 ISEE,[(3]Space@VT,[(4] バージニア工科大

Solar Flare effects on the High Latitude Electrodynamics

#Shibaji Chakraborty[1)], Nozomu Nishitani[2)], Joseph B.H. Baker[3)], John M. Ruohoniemi[4)]
[(1]Virginia Tech,[(2]ISEE, Nagoya Univ.,[(3]Space@VT,[(4]ECE, Virginia Tech,

A solar flare is a space weather event that causes a transient in the ionospheric system at sub-auroral, middle, and lower latitudes, commonly known as the solar flare effect (SFE). However, flare peaking beyond X-class or higher can impact current systems at auroral and polar latitudes. Using ground-based radars and magnetometers located in high latitude North American sectors, we conducted an event study on the X9.3 flare on 6 September 2017. We found: (i) SuperDARN radar located at Saskatoon (auroral latitude, dawn sector) observed a sudden appearance of ionospheric scatter following the flare; (ii) SuperDARN Inuvik radar, located at polar latitude, recorded a sudden reduction in plasma flow velocity; (iii) significant enhancement in geomagnetic field intensity observed by ground magnetometers, which lasted about 3-hours; (iv) several SuperDARN radars located at the nightside also recorded a change in plasma convection. Apparently, the sudden appearance of ionospheric irregularity structures near auroral latitudes-dawn sector and the change in nightside ionospheric plasma flow at auroral latitudes are related to a change in the ionospheric Hall/Pederson conductivity and current system. In addition, the longer lasting intense geomagnetic field variations detected by the magnetometer stations suggest a change in the day-night ionospheric current system. Finally, the reduction in plasma flow velocity observed by a polar latitude radar is predominantly driven by the reduction in efficiency of mechanical energy conversion in the dayside solar wind-magnetosphere-ionosphere (SW-M-I) interaction. This work demonstrates flare effects on auroral currents, nightside effects, and a reconfiguration of MI coupling morphology.