

SuperDARN Hokkaido radar observation of subauroral convection flow enhancement

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Subauroral ionosphere and the electric field therein are one of the most important subjects for space weather research because they are directly coupled to ring current particles. During magnetic storms, it may be possible that the dynamic variation of the ring current particles produce strong subauroral electric fields via magnetosphere-ionosphere coupling. We report statistical properties of subauroral convection flow enhancement using more than one year observation data from SuperDARN Hokkaido radar. Keogram analysis is applied within the Hokkaido radar field-of-view to derive latitude-time profile of convection flow enhancement especially at 20h magnetic local time where the subauroral polarization streams (SAPS) observed frequently. Although the solar activity in 2007 is relatively low and there are no major storms, we can statistically compare storm time and non-storm time convection flow under relatively high Kp condition of more than 3+ using several moderate storms driven by corotating interaction regions. It is suggested that the storm-related ring current particles are necessary for producing the subauroral flow enhancement events.