R006-08
C 会場 ：11/5　PM2 （15:45-18:15）
16:00〜16:15

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Smooth expansion of cusp aurora and expansion accompanied with mesoscale auroral detachment during plasma flow burst

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Previous studies have shown that a moving mesoscale cusp aurora, which is separated by regions devoid of aurora, is accompanied by fast plasma flow nearby. The purpose of this study is to determine if a moving mesoscale cusp aurora actually appears whenever very fast plasma flow occurs. First, we identified approximately 77 hours from five winter seasons as the period of the simultaneous observation of the dayside 630-nm aurora from an all-sky imager at Svalbard and the EISCAT Svalbard Radar (ESR) at 76 MLAT. Using ESR data from that period, we examined the ion temperatures, which reflect plasma flow burst, and confirmed that the ion temperatures in the F-region above 2000 K at 76 MLAT in daytime sector represent very fast plasma flow in the cusp. A detailed analysis of a representative case of such high ion temperatures observed repeatedly on December 8, 2016 revealed that the smooth poleward expansion of the main cusp emission is a clear phenomenon that occurs simultaneously with the plasma flow burst. This indicates that the formation of a moving mesoscale cusp aurora is not directly related to whether the plasma flow is fast or not in the cusp. The analysis also showed that expansion accompanied with mesoscale auroral detachment tends to occur with the motion of auroras with relatively large longitudinal speed. We also found from two-dimensional local simulation that the F-region ion temperatures tend to increase more on the poleward side of the main cusp emission than within it although the ion temperatures generally reflect the plasma flow well.