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A Statistical Study of Drifts of Patchy Pulsating Aurora : Observed by THEMIS All-Sky Imagers

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Patchy pulsating aurora (PPA) is a very common ionospheric phenomenon and thus offers us a unique opportunity to study the inner magnetospheric dynamics. It is usually excited by a few to 10s Kev electrons and occurs in the equatorward part of the auroral oval. Many previous studies have been done to investigate the motion of PPA patches, but none of them were based on a large dataset. In this study, we use data during May 2006 through July 2013 obtained from THEMIS all-sky imager at Gillam station (66.18 magnetic latitude, 332.78 magnetic longitude) to explore the statistical behavior of PPA and the motion of PPA patches. The statistical result of PPA patch motions showing that PPA patches mostly move westward in pre-midnight and move eastward in post-midnight, which is similar to the motion of ionospheric convection, has a great agreement with previous studies. Also, individual PPA cases have been analyzed to show the spatial and temporal evolution and variations of the motion of PPA patches, which suggests that PPA patches would provide us a great method to derive the electric field and remote sense the magnetospheric convection in high resolution both in time and space scale.

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