Quasi-Periodically Recurring of Equatorward Moving Arcs Observed in MLT Postnoon Sector by the All-sky TV Camera at Zhongshan

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It is well known that the magnetopause is the coupling region for solar wind momentum and energy into the magnetosphere and the injection region for magnetosheath plasma into the cusp ionosphere. Dayside aurora has been considered as an image of plasma processes in the boundary layer of the dayside magnetosphere and a variety of dayside aurora forms have been discussed as possible signatures of relevant plasma processes there.

Along the dayside oval, there is a special region centered at ～15 MLT and ～75 ° MLAT where the aurora occurrence shows a local peak. It is thus called the '15MLT hot spot'. The Zhongshan station locates at 69.37 ° S, 76.38 ° E (Inv. Lat. -74.5 °) and can well observe the auroral phenomena occurring in this 'hot spot' region.

A survey on aurora showing quasi-periodic (QP) nature has been carried out by using the whole year's data of all-sky video images taken in 1997 at Zhongshan. Among the interesting findings of this survey, we report here one kind of postnoon QP phenomenon, which is characterized by the QP recurrence of equatorward moving arcs, with periods ranging from 250 to 750 seconds. The equatorward motion distinguishes it from the phenomenon termed in literature 'poleward moving auroral forms' (PMAFs), which are often regarded as optical signatures of FTEs. Incorporating with the ground optical data, we use simultaneous magnetic data by the IMAGE chain and the GEOTAIL satellite, visible images and particle data by DMSP satellites, and Polar UVI images covering the conjugate counterpart in northern hemisphere, to discuss its source mechanism in the magnetospheric boundary layer.