

Quasi-Periodically Emerging of Arcs (QPEA): A New QP Phenomenon in Postnoon Aurora

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A survey with 1997 whole year's data of all-sky video images taken at Zhongshan shown that: 1) quasi-periodic (QP) phenomena in postnoon aurorae were so pronounced that they occupied high as 30% of all aurora events, and 2) QP auroral phenomena can be classified into 3 distinct types according to the aurora morphology, namely, Type1: corona, Type2: arc/band, and Type3: QP emerging of arcs. Here we report a specific QP type, the Type3, which was first defined by us. It is characterized by QP emerging of arcs moving equatorward, and basically appears as multiple arcs on an all-sky image at some instances. Six events of this type are found in 1997's data and simultaneous all-sky image, scanning photometer, Polar UVI and IMAGE magnetic chain data are used to document its features.

The dayside magnetopause and boundary layer have been suggested to be the injection region for magnetosheath plasma into the magnetosphere and the transfer region for magnetosheath energy and mass into the polar cusp ionosphere. Massive statistics with both of DMSP electron precipitation and POLAR ultraviolet imagery data confirmed the aurora occurrence maximum around 1500MLT and 75 MLAT, called '15MLT hot spot'. The Zhongshan station (69.37oS, 76.38oE, Inv. Lat. - 74.49o) locates right on the passage of this 'hot spot' and an auroral observation system has been deployed since 1995.

A survey with 1997 whole year's data of all-sky video images taken at Zhongshan shown that: 1) quasi-periodic (QP) phenomena in postnoon aurorae were so pronounced that in average they occupied high as 30% of all aurora events, and 2) QP auroral phenomena can be sorted into 3 distinct types according to the aurora morphology, namely, Type1: corona, Type2: arc/band, and Type3: QP Emerging of Arcs (QPEA). Among these 3 QP types systematic differences on MLT-dependence and period distribution were found. Here we report on a specific one of the three QP types, which was first defined by us. It is characterized by QP Emerging of Arcs moving equatorward, and appearing as multiple arcs on an all-sky image at some instances. Six events of this type are found in 1997's data. Simultaneous all-sky image, scanning photometer, Polar UVI and IMAGE magnetic chain data are used to document this type's features.