Statistical study of dayside pulsating aurora

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Pulsating aurora normally occurs after a substorm breakup in the midnight sector, often observed to persist through the morning sector and beyond. Indeed, it has also been observed on the dayside; however, the characteristics of the dayside pulsating aurora are poorly known. A handful of observational studies have been reported, but the results are somewhat disputable because most of the studies had non-uniform sampling of the dark dayside region. Furthermore, the previous studies used photometer data, with which the spatial characteristics of the pulsating aurora cannot be examined. To determine both temporal and spatial characteristics of the pulsating aurora, we have studied three years of all-sky image data obtained at the South Pole station. Because of its unique geographical location, the station has 24 hours of darkness during the austral winter from April to August, providing an ideal platform for studying dayside aurora. In a preliminary survey of the data, we have identified the pulsating auroras in 198 days out of 365 days of observations. The magnetic local time (MLT) distribution of the occurrence peaks between 9:00 and 11:00, but shows no or little dependence on the geomagnetic activity. In many events, pulsating patches initially appear as east-west aligned arc segments and later in the afternoon sector develop into large, diffuse patches, which occasionally fill a large part of the field of view. Using the long-term data, we will statistically examine both temporal (occurrence rate, duration and pulsation period) and spatial (sizes and shapes) characteristics of the dayside aurora.