Periodic variations of the high red aurora on the nightside

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A high red aurora can be produced by downgoing broadband electron associated with Alfvenic acceleration. Previous satellite observations have revealed the detailed characteristics of broadband electron precipitation, but we still do not understand how the broadband electron precipitation develops and decays. In this study, we have analyzed 630-nm auroral image data obtained in the nightside MLT sector by an all-sky imager (located at Longyearbyen, Svalbard), and examined how a high red aurora appears in a discrete auroral arc. To understand how tall the high red aurora is, we compared the auroral distribution with predicted red line emissions calculated by the Global Airglow model. The comparison shows that the height of the estimated volume emission rate for the discrete auroral arc have periodic variations during the course of the poleward motion of the discrete auroral arc. We discuss the reason for the periodic features of broadband electron precipitation.

Keywords: aurora, broadband electron precipitation

