



In search of the ground image of magnetopause surface oscillations

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Long-period pulsations in the nominal Pc5-6 band (periods about 3-20 min) have been known to be a persistent feature of the ULF activity at dayside high latitudes. The mechanism and origin of these pulsations have not been firmly established yet. Magnetopause surface eigenmodes were suggested as a potential source of high-latitude ULF waves. A ground response to these modes is expected to be beneath the ionospheric projection of the open-closed field line boundary (OCB). Using data from multiple instruments located in Svalbard we study the transient geomagnetic response to impulsive intrusion of magnetosheath plasma into the dayside magnetosphere. These intrusions have been triggered by modest changes of IMF to southward, and they are observed as a sudden shift of the equatorward red aurora boundary to lower latitudes. Each intrusion is shown to be accompanied by a burst of geomagnetic pulsations with frequency around 1.5 mHz and sudden enhancement of green line emission in a wide range of latitudes. We examine the local latitudinal structure of these high-latitude pulsations recorded by magnetometers covering near-cusp latitudes. The ULF power structure is compared with the instant location of the equatorward boundary of the cusp aurora, that is assumed to be a proxy of the OCB. The OCB latitude has been identified using data from the meridian scanning photometer at Longyearbyen. The comparison has shown that the latitudinal maximum of the transient ULF response tends to be located near the disturbed OCB optical proxy. Thus, the recorded pulsations may be associated with the ground image of the magnetopause surface modes.