

PHOTOMETRIC STUDY OF PULSATING PRECIPITATIONS OF THE RING CURRENT ENERGETIC PARTICLES AT LATITUDES OF THE OUTER PLASMASPHERE

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It is known that the stable auroral red (SAR) arcs are the consequence of interaction of the outer plasmasphere (plasmopause) with energetic ions of the ring current. The diffuse aurora (DA) is caused by the low-energy electron precipitation from the plasma sheet. During substorms we observe the intensity increase of DA and its equatorward extension up to the plasmopause projection which is mapped by the SAR arc appearing at that time. At a recovery phase period of intense substorms at latitudes of SAR arc the luminosity pulsations in the 427,8 nm N_2^+ emission owing to the pulsating precipitations of the ring current energetic particles in the outer plasmasphere usually occur (Ievenko et al, Adv. Space Res., 2008).

Here we present the new results of the spectrophotometric observations at the Yakutsk meridian (199° E geomagnetic longitude). The detailed relationship of the development of pulsating variations of the N_2^+ band intensity to the formation of SAR arc equatorward of the DA boundary in the 557,7 nm emission is shown. The basic types of the luminosity pulsation spectra in the frequency region 0.02-1 Hz are analyzed. The delay of 0.1-0.5 s in the luminosity pulsation development at SAR arc latitudes relative to a pulsation in DA (EMBED Equation.3L=0,5-0,7 R_E) has been revealed. It is supposed that the appearance of pulsating precipitations at latitudes of the SAR arc (outer plasmasphere) in these cases can be caused by the propagation of hydromagnetic waves from the region of source (pulsations in the diffuse aurora) inwards the magnetosphere.

Ring current, outer plasmasphere, SAR arc, pulsating precipitations

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