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Dynamics of zonal components of the cosmic ray distribution during geomagnetic storms

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We present the results of studies of zonal harmonics of the cosmic ray distribution during geomagnetic storms. Zonal harmonics have been determined using a global survey method as a variant of spherical analysis of the world neutron monitor network data. We have analyzed 56 major geomagnetic storms observed in 1997 - 2005. It is shown that a sharp increase (> 0.7%) of zonal component amplitude of the isotropic part of cosmic ray distribution precedes a geomagnetic storm. A probability of precursor manifestation is about 75% , and the time of advance of a magnetic storm is 10 hours on the average. It is shown that the global survey method can be used for the effective short-term prediction of geomagnetic disturbance onset.

Collaboration

– not specified –

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Author: GRIGORYEV, Vladislav (ShICRA of SB RAS)

Co-authors: Mr GOLOLOBOV, Petr (ShICRA of SB RAS); Dr STARODUBTSEV, Sergey (ShICRA of SB RAS)

Presenter: Mr GOLOLOBOV, Petr (ShICRA of SB RAS)

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