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Features of Daily Variation in Cosmic Ray Intensity During High/Low Amplitude Events

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Abstract: A detailed study has been conducted on the long-term changes in the diurnal, semi-diurnal and tri-diurnal anisotropy of cosmic rays in terms of the high/low amplitude anisotropic wave train events (HAE/LAE) during the period 1981--94 using the neutron monitor data from the Deep River neutron monitoring station. In all, 38 HAE and 28 LAE cases have been studied. An inter-comparison of the first three harmonics during these events has been made so as to understand the basic reason causing the occurrence of these types of events. It has been observed that the phase of diurnal anisotropy shifts towards earlier hours for HAEs; similarly, it shifts towards earlier hours as compared to the 18-Hr direction for LAEs. Semi-diurnal anisotropy phase is found to remain statistically the same for both HAE as well as for LAE. Further, tri-diurnal anisotropy phase is found to be evenly distributed for both types of events. The interplanetary magnetic field (IMF) and solar wind plasma (SWP) parameters during these events are also investigated. It has also been observed that HAE/LAEs are weakly dependent on high-speed solar wind velocity.

Key Words: cosmic ray, diurnal, semi-diurnal, anisotropy, high-speed solar wind streams and interplanetary magnetic field.

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