



Study of interpretation of diurnal variation anisotropy of the cosmic ray

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Abstract

In the recent work the amplitude of the diurnal anisotropy remains quite low and statically constant whereas the phase remains in the azimuthal/corotational/18-Hr direction either, or it shifts toward earlier hours for majority of the events for LAE. The amplitude of the diurnal anisotropy remains quite high and statically constant for majority of the events.

Keywords: cosmic ray, anisotropy

Introduction

A diurnal variation in cosmic ray intensity is observed because the intensity is not the same from all directions around the earth. A neutron monitor with a limited asymptotic cone of acceptance scans different parts of the sky as the earth rotates about its axis. The anisotropy in cosmic ray intensity is quite the critical analysis of diurnal variation calculated on a day to day basis from ground based data (Ananth *et al.*)^[1] as well as on the average basis for extended periods (Ahluwalia and Riker,^[2] Shrivastava and Shukla^[3]) that the simple corotation picture was inadequate to account for all the observed features. These characteristic of diurnal variation have been derived by using the vanational coefficients (Rao *et al.*)^[4] which include rigidities up to 500 GV.

The studies of Diurnal Anisotropy

In contrast the existence of 20-year wave in the diurnal anisotropy of cosmetic ray proposed by Forbush⁵ is disputed by Ahluwalia⁶. It is argued that the diurnal anisotropy is unidirectional during 1957-71, with its direction along the 18 hour local time. The annual mean diurnal anisotropy observed

during 1991-97 consists of two component one in the east-west anisotropy which is identical to V component. The variation of cosmic ray intensity may be studied in several ways. Most of the information on the cosmic ray daily variation has been derived through a study of diurnal component.

Results and discussion

The amplitude and phase of the diurnal anisotropy for the LAE are plotted in the above Fig. (I) and (II). The amplitude of the diurnal anisotropy remains low for most of the days of event where as the phase shifts toward later hours expect for one day. The amplitude of the diurnal anisotropy remains statically the same, where as the phase shifts toward later hours for earlier period of events while the shifts toward earlier hours for later part of events. Ananth *et al.*^[7] on their study of diurnal anisotropy on day to day basis conclude that on an average basis the diurnal anisotropy of cosmic radiation is completely understood as a superposition of simple convention and field aligned diffusion on a day to day basis this concept holds good on more than 80% of the day^[8,9].

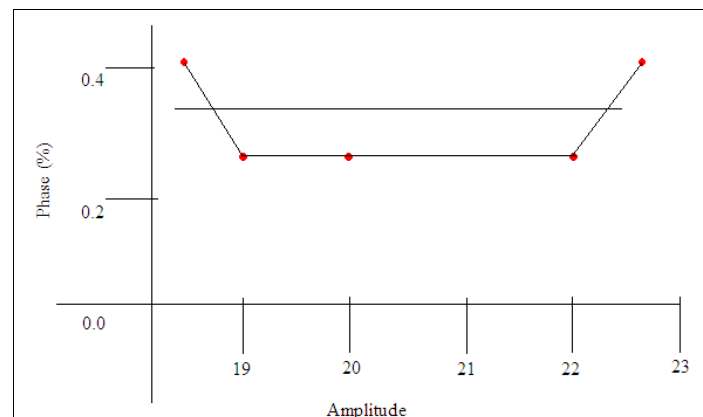


Fig 1: Diurnal Anisotropy

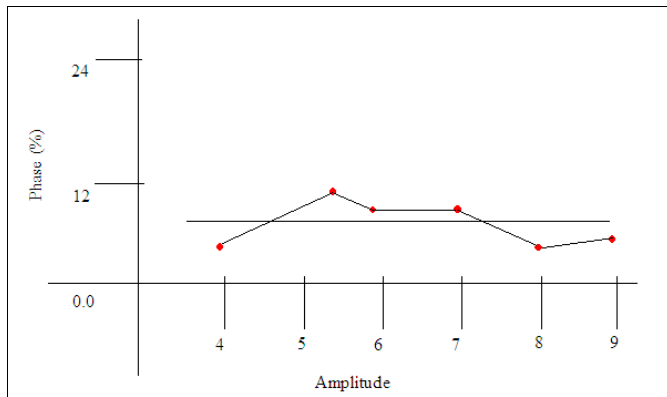


Fig 2

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