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Meteoric activity over a low latitude station, Hyderabad

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Abstract. The radio observations of sporadic meteors, carried out during the period 1983-88, have been studied.

Key words : radio observations—meteors activity

1. Introduction

Sporadic meteors are those which are not members of any recognised meteor shower and moving in random orbits. Further, they have radiants randomly distributed over the sky. The radio observations of sporadic meteors were carried out at high latitude stations (Hawkins 1956; Millman & McIntosh 1964; Ceplecha 1958). Very little work has been done on sporadic meteors at low latitude stations. The present work on sporadic meteors carried out at Hyderabad, during 1983-88, fills up this gap.

The sporadic meteor observations have been carried out by using forward-scatter meteor equipment. In each month, five non-shower days have been selected and the meteor echoes have been recorded round the clock. The data thus obtained is used to determine the mean hourly meteor rates. From these mean hourly rates, curves representing the diurnal, seasonal and annual variations in the occurrence of sporadic meteor activity have been obtained and presented in this paper. The variations obtained at Hyderabad are also compared with the values of the other stations like Ottawa and Waltair.

2. Observations and discussion

From the analysis of the meteor echo records, obtained during 1983-88, it is found that :

1. The sporadic meteor activity is more in the second half of the year than in the first half. It is also seen that the activity is more in the post mid-night hours, leading to the occurrence of peak activity around 0600 hours L.T., which shows a global phenomenon. In all the diurnal curves a dip is observed consistently around 1000 hours L.T., which may be attributed to rapid increase in absorption at D-region of the earth's atmosphere (Baldwin *et al.* 1962). The diurnal ratios are found to vary in the range 2.1 to 4.1. The maximum rate recorded is 420 per hour in the months of November and June and minimum is about 90, observed in the month of February (figures 1 and 2).

2. The mean hourly rate is found to be maximum in summer and minimum in equinoxes with diurnal ratios 2.5, 3 and 2.2 respectively for summer, winter and equinoxial months

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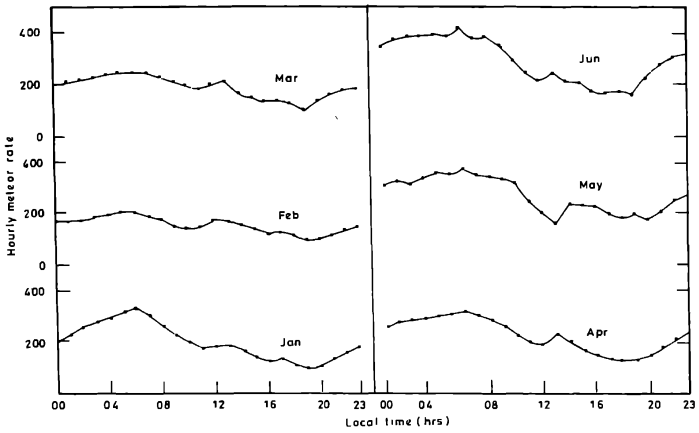

Figure 1. Diurnal variation of sporadic meteor rates at Hyderabad during 1983-88 for the months January to June.

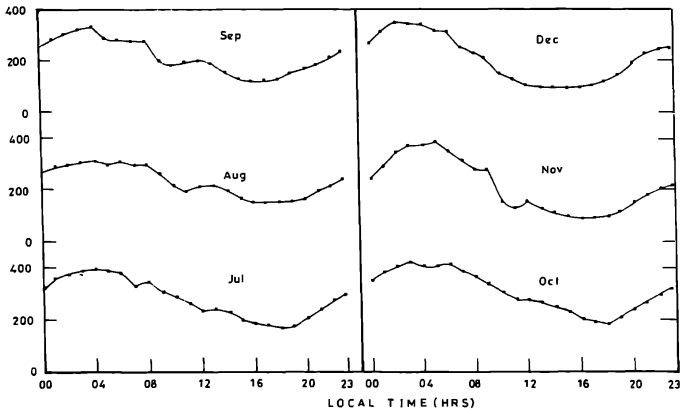

Figure 2. Diurnal variation of sporadic meteor rates at Hyderabad during 1983-88 for the months July to December.

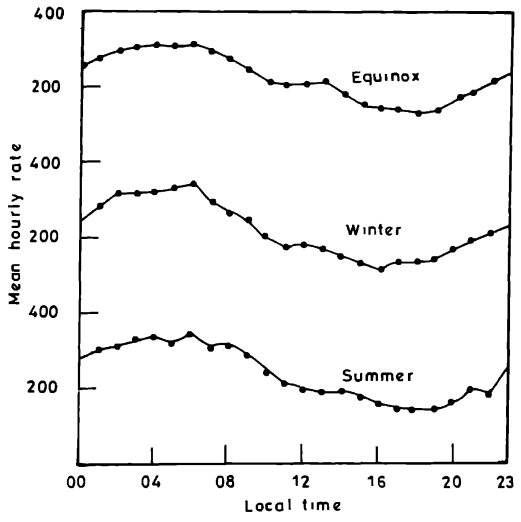

Figure 3. Seasonal variation of sporadic meteor activity.

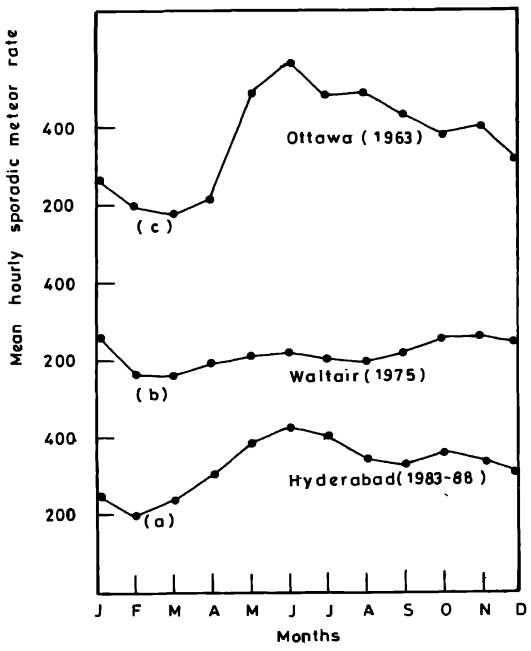

Figure 4. Annual variation of sporadic meteor rates.

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(figure 3). These minor seasonal variations are because of the tilt of the earth's axis relative to the ecliptic plane (Sugar 1964).

3. The annual variation curves (figure 4) show peak activity of sporadic meteors in summer and minimum in the equinoxial months which are in good agreement with that of other radio observations (McKinley 1961).

4. The distribution of sporadic meteor radiants with respect to the local ecliptic longitude ($\lambda - \lambda_\odot$) show radiant concentration towards the apex point (indicated by an arrow in figure 5).

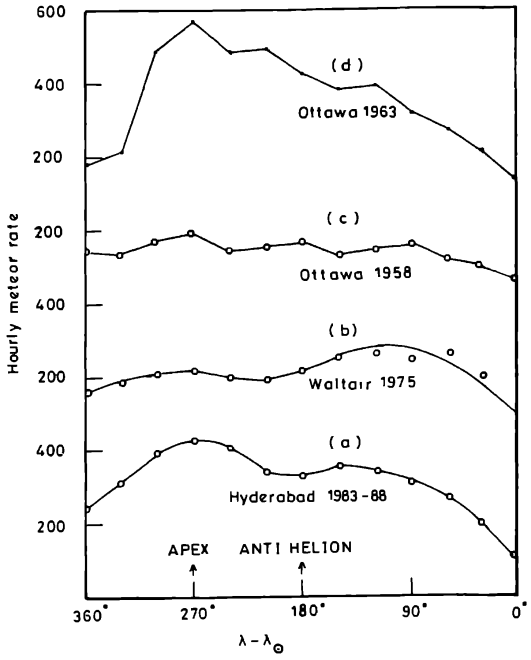

Figure 5. Distribution of sporadic meteor radiants.

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