

Meteor stream activity I. The annual streams.

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Abstract (from CDS): Between 1981 and 1991, a small group of amateur meteor observers in Australia and the Netherlands counted meteors during 4,482 hours of effective observing time. These counts have been reduced and are to be presented here as a first homogeneous set of some 50 meteor stream activity curves for all major and many minor meteor streams on both hemispheres. Together with the sporadic background, these give an accurate picture of annual meteor activity.

Empirical corrections are given that relate the observed meteor rates to well defined Zenith Hourly Rates (ZHR). It is found that all major streams are well represented by a set of exponential curves: $ZHR = ZHR_{\max} 10^{-B|\lambda_{\text{sun}} - \lambda_{\text{sun}}_{\max}|}$. Values of ZHR_{\max} and B are given. There is no evidence for stable sub-maxima in the activity profiles. In four, and possibly six, cases, there is evidence for a background component in the activity curve. In all cases, the background is more extended to small solar longitude λ_{sun} . From a fit of the above dependence to the rates of minor streams, it is found that the slopes of most high inclination ($i > 15^\circ$) streams have a characteristic value of $B = 0.19 \pm 0.08$ per degree of solar longitude increase in the $10 \log$ of the ZHR. The ZHR is transformed into mass influx rates, from which the total mass in the meteoroid stream is estimated by making an assumption about the distribution of matter perpendicular to the path of the Earth. Total masses of the observed streams are of order 10^{14} to 10^{16} g.

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Journal keyword(s): meteors: meteoroids - comets: general

CDS file: <Available at CDS (J/A+A/287/990): tables3>

Link(s): ADS services
