

Advances in Meteoroid and Meteor Science, 2008, pages 315-322

Physical characteristics of kazan minor showers as determined by correlations with the arecibo UHF radar

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Abstract

In the northern hemisphere, the month of February is characterized by a lack of major meteor shower activity yet a number of weak minor showers are present as seen by the Kazan radar. Using the Feller transformation to obtain the distribution of true meteor velocities from the distribution of radial velocities enables the angle of incidence to be obtained for the single beam AO (Arecibo Observatory) data. Thus the loci of AO radiants become beam-centered circles on the sky and one can, with simple search routines, find where these circles intersect on radiants determined by other means. Including geocentric velocity as an additional search criterion, we have examined a set of February radiants obtained at Kazan for coincidence in position and velocity. Although some may be chance associations, only those events with probabilities of association > 0.5 have been kept. Roughly 90 of the Kazan showers have been verified in this way with mass, radius and density histograms derived from the AO results. By comparing these histograms with those of the background in which the minor showers are found, a qualitative scale of dynamical minor shower age can be formulated. Most of the showers are found outside the usual apex sporadic source areas where it is easiest to detect discrete showers with less confusion from the background. © 2007 Springer Science+Business Media B.V.

http://dx.doi.org/10.1007/978-0-387-78419-9_45

Keywords

AO, HPLA, Kazan, Meteor shower, Radar, Sporadic source