

A Method for Determining the Coordinates of Meteor Shower Radiants from Meteor Radar Goniometric Data

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Abstract

We discuss a new method for measuring the coordinates of meteor shower radiants from meteor radar data. The method uses a high accuracy of radar goniometer measurements of one of the angular coordinates for meteor radiants and collective properties of incident meteor showers. It is based on a computer technology of searching for the coordinates of radiants using the intersections of meteor position lines on the celestial sphere and filtering nonrandom combinations of these intersections. The method allows the following: to detect meteor showers with a rate of more than 5 per day of observations and to separate meteor groups from different meteor showers with different radiants and velocities. The method makes it possible to increase the angular resolution from $10^\circ \times 10^\circ$ achieved with a quasi-tomographic technique to $2^\circ \times 2^\circ$, with a prospect of a further increase in the accuracy through the individual reduction of separated meteor groups. We use the reduction of one-day-long observations during maximum activity of the Geminids meteor shower in 1993 to illustrate the potentialities of the method. We show an example of detecting a weak meteor shower that was active during December 1993.

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