

Influence of measurement errors on heliocentric orbit

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In the present study, we demonstrate how strong the influence of measurement errors on the resulting meteoroid orbit can be. We concentrate on orbits which correspond to the intermediate part of the bimodal velocity distribution of sporadic meteors. We test the modification of the heliocentric orbital elements in dependence on the directly measured parameters, the pre-atmospheric velocity and the position of the radiant, by a simple model of the geometry of the meteoroid encounter with the Earth. The large dispersion of the measurement errors fills the gap corresponding to the minimum of the velocity distribution curve and creates a population of spurious orbits.