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## PHYSICAL PROPERTIES OF METEORIODS ACCORDING TO MIDDLE AND UPPER ATMOSPHERE RADAR MEASUREMENTS

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### ABSTRACT

We introduce a novel approach to reliably interpret the meteor head echo scattering measurements detected by the 46.5 MHz Middle and Upper atmosphere (MU) radar system near Shigaraki, Japan. The data reduction steps include determining the exact trajectory of the meteoroids entering the observation volume of the antenna beam and calculating meteoroid mass and velocity as a function of time. The model is built using physically based parameterization. The considered observation volume is narrow, elongated in the vertical direction, and its area of greatest sensitivity covers a circular area of about 10 km diameter at an altitude of 100 km above the radar. Over 100000 meteor head echoes have been detected over past years of observations. Most of the events are faint with no alternative to be detected visually or with intensified video (ICCD) cameras. In this pioneer study we are focusing on objects which have entered the atmosphere with almost vertical trajectories, to ensure the observed luminous segment of the trajectory is as complete as possible, without loss of its beginning or end part due to beam-pattern related loss of signal power.