

Analysis of the characteristics of meteor particles by multi-technique observations

**Kartashova A. (1), Rybnov Y. (2), Popova O. (2), Bolgova G. (1),
Glazachev D. (2), Efremov V. (2)**

(1) Institute of Astronomy, Russian Academy of Sciences, Moscow, Russian Federation

(2) Institute of geosphere dynamics of Russian academy of sciences, Moscow, Russian Federation

e-mail: akartashova@inasan.ru

The interaction of meteor particles with the atmosphere produces the optical (actually meteors) and infrasound emission. Simultaneous multi-technique observations of meteors make it possible to compare estimates of meteoroid characteristics obtained from different observational data, to refine models and methods. As a result of optical observations from several points (Zvenigorod Observatory INASAN, point "Istra" and geophysical Observatory Mikhnevo IDG RAS) (from 2012) were obtained several thousand meteor registration, for which various parameters were determined (radiant, geocentric velocity, height of beginning and ending, magnitude, orbital parameters, etc.). In 2014, the first test multi-technique observations were carried out by INASAN and IDG RAS, and in 2016 they were continued. Acoustic observations were carried out from three points (at the Mikhnevo geophysical Observatory of IDG RAS, IDG RAS, and the Zvenigorod Observatory of INASAN). Analysis of infrasound registrations and their comparison with optical observations made it possible to identify several dozens of acoustic signals corresponding to optical registrations (from several points). The energies and masses of meteor particles were estimated from the parameters of infrasound signals. The characteristics of meteor particles for which simultaneous observations (acoustic and optical) were compared. Comparisons of masses and energies obtained from optical and infrasound observations show a significant spread of values (up to two orders of magnitude or more). Possible explanations may include large uncertainty of all used approximations, still not perfect photometry and other reasons. This problem needs further investigation and data accumulation; both observational systems need to be improved.