Test optical and acoustical meteor observations in Russia

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Introduction

The interaction of meteoroids with the atmosphere generates an optical (meteors), and acoustic radiation. Most meteor particles do not fall on the Earth's surface and their properties (mass, size and etc.) are estimated based on observational data under different assumptions. The details of meteoroid-atmosphere interaction are poorly known, therefore the parameters of meteor particles are determined with large uncertainty. Simultaneous registration of meteors by different techniques will allow to improve the estimates of meteoroid parameters as well as to clarify the processes caused by particle interaction with the atmosphere.

Observations

Test combined (optical and acoustical) meteor observations were organized by Institute Astronomy RAS (INASAN) and Institute Dynamic of Geospheres RAS (IDG RAS) in 2014. The optical double-station observations were carried out at the Zvenigorodskaya observatory (INASAN) and Geophysical observatory "Mikhnevo" (IDG RAS) (Fig.1). More than 1000 meteors were registered. Their dynamic parameters (the atmospheric trajectory, the velocity and orbital parameters) and light curves were obtained.

Continuous monitoring of infrasound is carried out at Geophysical Observatory "Mikhnevo". Pressure variations are recorded by microbarometers, which are sensitive in the frequency band of 0.001 - 20 Hz. The test observations were conducted in order to check possibility of continuous combined (optical and acoustical) monitoring. The goal of combined monitoring is to study the formation and propagation of pressure pulses, which are formed due to the interaction of meteoroids with the atmosphere, the optical registration will provide independent estimates of meteoroids parameters [1], [2]. Results of the test combined observations are presented.



Fig 1. Locations of video meteor stations

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References

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