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Double-Station Meteor Observations in Ryazan, Russia

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Optical double-station observations and light observations were carried out. Results of CCD meteor observations of 2011 and 2012 are analyzed and presented. The results of wide-angle double Perseid observations make it possible to estimate the average meteoroid size over the period 2007-2012.

1. Introduction
2. Investigating circumzenithal space meteorites that enhance the meteoroid population.
3. Investigating near-space physical processes that are the basis of circumzenithal space meteorology.
4. Investigating meteorite, artificial space objects, and space debris that enter the zone of the circumzenithal space meteorology.
5. Implementing the results of the investigations to higher education.
6. Implementing the results of the investigations to the field of space ecology.

In addition, observations of light sources are necessary to assess the risk of asteroid impacts on space.

Observations and results.

We use two observing sites for monitoring meteor activity: (1) the University observatory (UO) in Ryazan ($54^{\circ}40'N$, $41^{\circ}50'E$, $R = 125$ m) and (2) Shtetlyy, about 15 km from Ryazan ($54^{\circ}40'N$, $41^{\circ}50'E$, $R = 125$ m).

In both stations, observations were performed using a Wide-SCHE camera and a Computer T1014F25 lens with an effective field of view of 100° diameter. The field of view was divided into 1000 cells. The control and registration were provided using a Flamingo Media Center ES on a notebook and an AHD T1014F25 Mobile processor, 1.05 GHz, 1 GB RAM.

The equipment functioned in the mode designed for registering bright meteors that constitute a danger for space hardware operating in the circumzenithal space (Martynov et al., 2007). Figure 1 shows the height-size distribution of meteors observed on 2007 August 7-11. It also presents a theoretical curve of the Perseid magnitude which corresponds to their population index $n = 2.6$, normalized to $N = 1$ at $m = -3$.

The comparison of the observed and theoretical curves shows that the observed meteoroid population is very close to the theoretical one. The height-size distribution of the observed meteoroids is very close to the theoretical one.

The density of the meteoroid flux relative to CCD-camera is very high. This relationship between the observed meteoroid population and the light flux density is shown in every single frame to better understand the results.

Figure 1 - Observing sites of the Ryazan State University.

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Figure 13 - Observing sites of the Ryazan State University.

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Figure 16 - Observing sites of the Ryazan State University.

Figure 17 - Observing sites of the Ryazan State University.

Figure 18 - Observing sites of the Ryazan State University.

Figure 19 - Observing sites of the Ryazan State University.

Figure 20 - Observing sites of the Ryazan State University.

Figure 21 - Observing sites of the Ryazan State University.

Figure 22 - Observing sites of the Ryazan State University.

Figure 23 - Observing sites of the Ryazan State University.

Figure 24 - Observing sites of the Ryazan State University.

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Bright Perseids in 2007

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The results of the 2007 Bright Perseids observations using a wide-angle camera are presented.

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1 Introduction

In 2007 July-August, we carried out optical monitoring of the circumzenithal space pollution with the bright Perseid meteorites.

The observations were conducted near Ryazan, Russia, $\lambda = 10^{\circ}43'$, $\mu = 14^{\circ}25'$.

2 Observations and data reduction

The observations were performed using a Wide-SCHE camera and a Computer T1014F25 lens with a field of view $110^{\circ} \times 60^{\circ}$. The lens was fixed and the camera was directed towards the local zenith. The control and registration were provided using a Flamingo Media Center ES on a notebook and an AHD T1014F25 Mobile processor, 1.05 GHz, 1 GB RAM.

The equipment functioned in the mode designed for registering bright meteors that constitute a danger for space hardware operating in the circumzenithal space (Martynov et al., 2007). Figure 1 shows the height-size distribution of meteors observed on 2007 August 7-11. It also presents a theoretical curve of the Perseid magnitude which corresponds to their population index $n = 2.6$, normalized to $N = 1$ at $m = -3$.

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Proceedings of the IMO

Wide-Angle TV-Observations of Bright Perseids in 2007-2009 and Risk in Space

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Results of the 2007-2009 bright Perseid TV-observations are presented. Collision risk with space vehicles is calculated.

1 Introduction

The circumzenithal space ecology, a new scientific trend, has been rapidly developing recently. It deals with the processes occurring in immediate space and affecting the brightest and most dangerous objects: meteorites, space debris, artificial space objects, and space debris that enter the zone of the circumzenithal space meteorology.

In 2007-2009 we carried out monitoring of bright Perseid meteorites (Martynov et al., 2008; Martynov, 2008; Martynov & Efimov, 2009). The observations were performed using a Wide-SCHE camera and Computer T1014F25 lens with a field of view $110^{\circ} \times 60^{\circ}$. The lens was fixed and the camera was directed towards the local zenith.

The comparison of the observed and theoretical curves shows that the observed meteoroid population is very close to the theoretical one. The height-size distribution of the observed meteoroids is very close to the theoretical one.

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