

Double-station observations of the Draconid meteor shower using newly developed MAIA system

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Abstract

An outburst of Draconid meteor shower was predicted for 8 October 2011 [1]. It was one of rare opportunities to observe this interesting meteor shower. Therefore we carried out the double station observation in Italy. Here we present the first results of this experiment.

1. Draconid shower

The enhanced activity of the meteor shower in 2011 was connected with material, which was ejected from the parent comet during its 1900 and 1907 perihelion passages [1]. The same material was responsible for great Draconid storms in 1933 and 1946 [2]. Among all the known meteor showers the Draconid meteoroids belong to the most fragile particles. They are classified as the group D in Ceplecha's classification [3]. Detection of deceleration for 6 Draconid meteors in 2005 allowed calculating the physical structure of the meteoroids [4].

1.1 System MAIA

We developed new video instrument for the meteor observation. The Meteor Automatic Imager and Analyser (MAIA) system is based on digital monochrome camera JAI CM-040 and well proved image intensifier XX1332 [5]. It provides us with spatial resolution of 776 x 582 pixels, maximum frame rate 61.15 frames per second, bit depths 10 bits, field of view $\sim 50^\circ$ and limiting stellar magnitude of $+8.0^m$. The Draconid meteor shower campaign was the first scientific test of this new instrument, although the cameras still were not operated in fully automatic mode.

1.2 Observations

The observations were carried out in Northern Italy. Coordinates of both stations are given in Table 1. The observational time was from 18:00 to 23:30 UT.

Table 1: Coordinates of stations

	Station A	Station B
Latitude	45°44'1.3" N	45°33'57.8" N
Longitude	9°11'16.5" E	8°30'18.2" E
Altitude	333 m	238 m

2. Results

The system MAIA-A recorded 62 meteors, whereas the MAIA-B 102 meteors. Majority of them indeed belongs to Draconid meteor shower. The data processing is still underway and the results will be published on the conference.

The activity profile shows that the maximum occurred at 20:10 \pm 0:10 UT. This is in good agreement with the model prediction [1]. It also agrees with the data from visual observations of IMO, which show a peak at 20:12 UT [6] as well as with the results of the narrow field-of-view camera aboard the aircraft DLR Falcon, which detected a peak of activity at 20:15 UT [7].

3. Conclusions

An outburst of the Draconid meteor shower was successfully recorded using newly developed video camera system MAIA. The records show higher quality of the data in comparison with current analogue video system. The peak of the shower activity occurred around the predicted time.

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