

## The 2002 Leonids in Poland — preliminary results

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The preliminary results of the Polish observations of the 2002 Leonids are presented. The first peak occurred on November 19, 04<sup>h</sup>12<sup>m</sup> UT with ZHR = 2351 ± 80. The FWHM of the maximum was only 18<sup>m</sup> which is about five times smaller than the predictions of the models.

### 9 Introduction

According to the models of McNaught & Asher (2002) and Lyytinen et al. (2001) (hereafter LNV), in 2002 we had the last chance to see the Leonid storm. Both these models, as well as new approaches performed by Jenniskens (2001) and Vaubaillon (2002), predicted two main maxima. The first one was expected around 04 UT on November 19, i.e. a very good time for observers in Poland.

The models predicted relatively large values of FWHMs for both maxima. These values were around two hours indicating that, during the first maximum, ZHRs of around 1000 should be observed as early as about 02 UT.

### 10 Observations

November weather conditions in Poland are usually very poor. Nevertheless we decided to organize an astronomical camp devoted to observations of the Leonids. The camp took place in the Warsaw University Observatory Station in Ostrowik in the period November 15–21.

The weather during the first part of the camp surprised all participants. The daytime temperatures were around 17°C and the nights were mostly clear. The best conditions occurred on November 17/18 when some of our observers made around 10 hours of visual observations. Unfortunately on November 18 it started to rain and the weather forecasts gave us no chance of clear skies during the night. In fact they were wrong and around midnight the sky started to clear and around 01 UT we started our visual, photographic and video observations.

In Ostrowik, good conditions lasted until 04 UT when thin clouds arrived from the west covering the whole sky. Fortunately our observers from the southern and eastern parts of Poland could observe even until 05 UT.

Here we present the preliminary results based on the observations of ten observers belonging to the Polish *Comets and Meteors Workshop (CMW)* who sent us their reports in electronic form soon after the night of the maximum. We focus only on the data from the night of November 18/19. The total effective time we collected was 22.29 hours during which we observed 2356 Leonids. This sample was divided into 270 estimates of the hourly rates. Below we show the list of our observers with their effective times of observation and numbers of detected meteors:

Dariusz Dorosz (3<sup>h</sup>80, 542), Tomasz Fajfer (1<sup>h</sup>50, 70), Karol Fietkiewicz (0<sup>h</sup>90, 63), Maciej Kwinta (3<sup>h</sup>60, 459), Krzysztof Mularczyk (2<sup>h</sup>95, 181), Arkadiusz Olech (2<sup>h</sup>88, 259), Łukasz Sanocki (3<sup>h</sup>13, 488), Konrad Szaruga (0<sup>h</sup>21, 66), Kamil Złoczewski (2<sup>h</sup>84, 177), Przemysław Żołądek (0<sup>h</sup>48, 51).

### 11 Results

In our calculations of the activity profile we assumed the population index  $r$  to be 2.0. A similar value of  $r$  was observed in 2001 during the maximum which occurred over Northern and Central America (Arlt et al., 2001). According to the models, this maximum and the first peak of the 2002 Leonids are caused by the same material ejected from the comet in 1767. Thus it is safe to assume that both profiles are characterized by the same value of population index.

The results of our calculations are presented in Figure 1, where we show the activity profile of the European peak of the 2002 Leonids. The data collected between 03:45 and 05:00 UT were fitted with a Gaussian function.

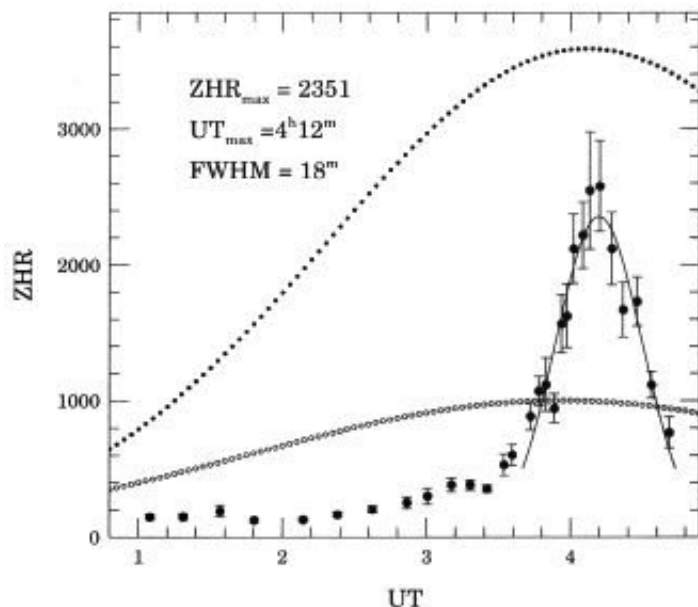


Figure 1 – The activity profile of the European peak of the 2002 Leonids based on the observations collected by the Polish *Comets and Meteors Workshop*. The solid line corresponds to the Gaussian fit to the data around the maximum. The open and filled circles denote predictions of models McNaught & Asher and LNV, respectively.

From this fit we found that the peak occurred at 04<sup>h</sup>12<sup>m</sup> with ZHR = 2351 ± 80. The FWHM of the max-

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imum was only  $18^m$  which is about five times smaller than the predictions of the models presented in (McNaught & Asher, 2002; Lyytinen et al, 2001). To show this discrepancy in a better form we plotted the activity profiles predicted by the models of Asher and McNaught and LNV with open and filled circles, respectively.

Our results are with excellent agreement with data presented in *IMO Shower Circular* (Krumov et al, 2002). According to this publication the European peak was observed at  $04^h10^m$  UT with  $ZHR = 2353 \pm 64$ .

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