Perseids 2002 in Poland

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Abstract

The recent results of the Polish *Comets and Meteors Workshop (CMW)* on Perseid activity are presented. Analyzing the data obtained during the night of the maximum, we concluded that the peak occurred on August 13 at 1^h07^m UT with ZHR $= 91 \pm 13$, assuming $\gamma = 1$. Additionally we present the ZHR evolution as well as the population index evolution.

1 Introduction

Every year the *Comets and Meteors Workshop (CMW)* organizes a summer astronomical camp at the Ostrowik Station of the Warsaw University Observatory, which is located 40 km south-east of Warsaw. In 2002 the *CMW* authorities decided to schedule the camp on August 1st and to last to the 18th so that participants ware able to watch the sky during the Perseid maximum. More that twenty members of *CMW* gathered there on these days. Overall we obtained 330 hours of effective visual observation time and 110 hours of effective telescopic observation time. This included 68.81 hours of effective time collected on the night of the Perseid maximum, that is August 12/13. During this night our observers made observations without plotting. The Perseid maximum was also observed by the CCD technique (see Wiśniewski 2003 for details).

2 Observations

During the night of the Perseid maximum, 2164 meteor events were classified as Perseids by our observers. As mentioned earlier, we obtained 68.81 hours of effective time that night. The full list of our observers with the effective times of their observations is given below:

Łukasz Kaminski (4.35^h), Krzysztof Socha (5.48^h), Arkadiusz Olech (4.97^h), Łukasz Woźniak (5.58^h), Daniel Bil (5.34^h), Konrad Szaruga (4.33^h), Łukasz Kowalski (5.66^h), Aleksander Trofimowicz (3.54^h), Karol Fietkiewicz (4.46^h), Tomasz Kowalski (5.66^h), Mateusz Kucharski (5.33^h), Krzysztof Mularczyk (5.50^h), Kamil Złoczewski (4.37^h).

From the collected data we estimated the population index r and ZHRs.

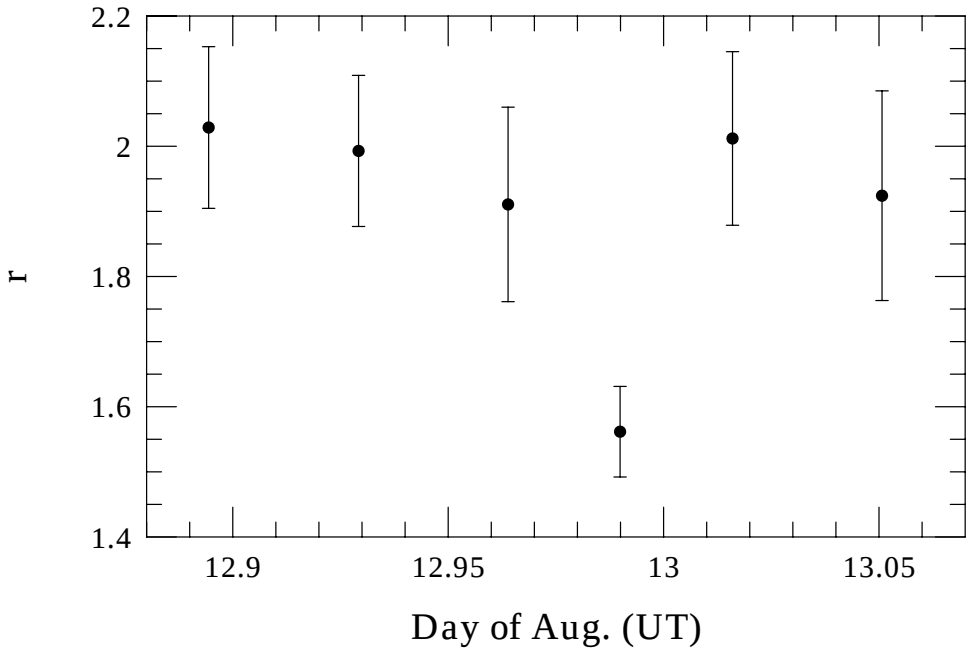

Figure 1: *Evolution of the population index r.*

3 Results

The analysis of *CMW* data was performed in a standard way described in detail by Olech et al. (1999). Here we summarize only the main points of this process.

The reasonably large amount of data encouraged us to compute the value of population index r according to equation (1):

$$r = \frac{\Phi(m+1)}{\Phi(m)} \tag{1}$$

where

$$\Phi(m) = \sum_{-\infty}^{m} N(m) \tag{2}$$

and $N(m)$ is the number of meteors with magnitude m corrected for the probabilities of perception given by Koschack and Rendtel (1990).

The population index changes over the period are shown in Figure 1. The lower value of the population index r indicates the time of the maximum, since the number of more massive meteors (corresponding to the number of brighter meteor events noticed) rises.

Knowing the values of r, we are able to compute the ZHR using the formula given in equation (3):

$$ZHR = \frac{N_h \cdot r^{(6.5-LM)}}{(\sin H)^{\gamma}} \tag{3}$$

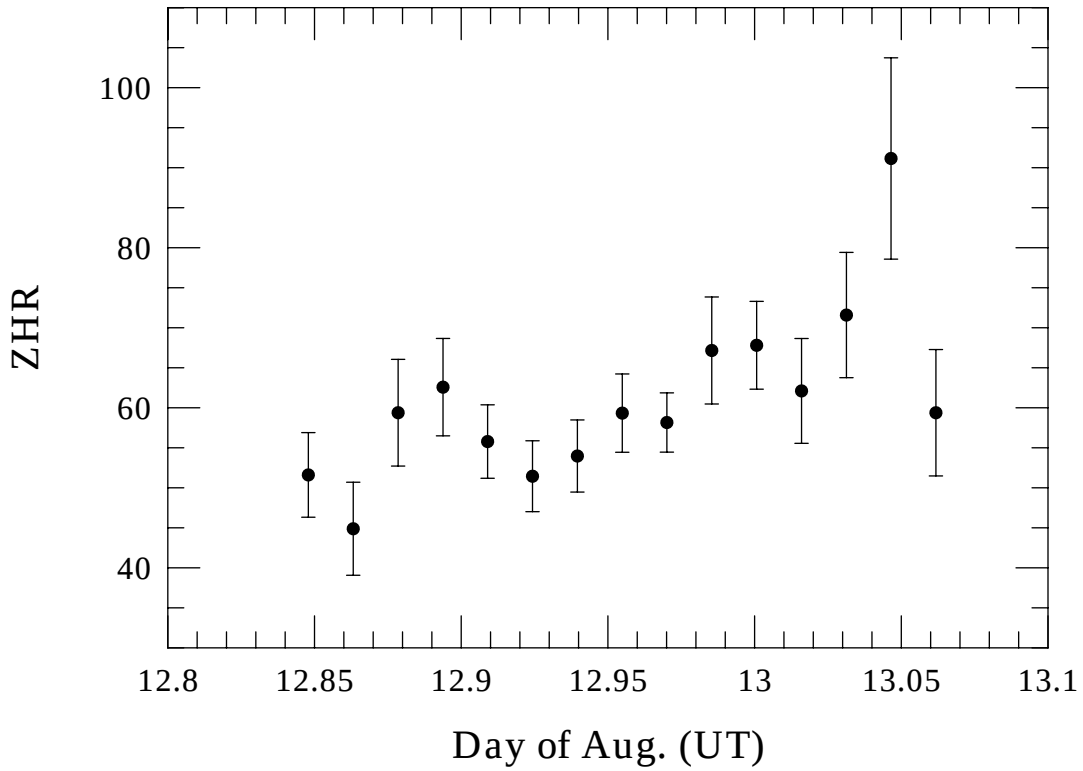

Figure 2: *The Perseid ZHR profile for* $\gamma = 1$.

where N_h is the observed number of meteors per hour (corrected for cloud cover), LM is the limiting magnitude in the field of view, H is the altitude of the stream radiant, and γ is the zenith exponent factor.

In line with the (Jenniskens, 1994) we adopted the zenith exponent factor $\gamma = 1.47$, which reflects additional corrections related to the finite length of meteor trails or the zenith attraction. We repeated all ZHR computations for $\gamma = 1$ (which reflects only the changes of meteor flux as a function of radiant altitude) for comparison. The time of the maximum is the same in both cases. The results are shown in Figures 2 and 3.

4 Conclusions

The activity profile of the 2002 Perseid maximum shows a distinct peak on August 13 around 1 UT. Assuming a zenith exponent γ equal to 1.0 we obtained the maximal ZHR $= 91 \pm 13$. However, we point out that ZHRs during evening hours were quite low ($\sim$50) which is in disagreement with the preliminary results of the *IMO* (Arlt & Buchmann 2002). The differences between the data sets could be minimized by assuming larger value of the zenith exponent. According to Jenniskens (1994) γ could be as high as 1.47, and with this value the ZHRs at the beginning of the maximum night are around 80 without any significant change of the moment and level of the main peak.

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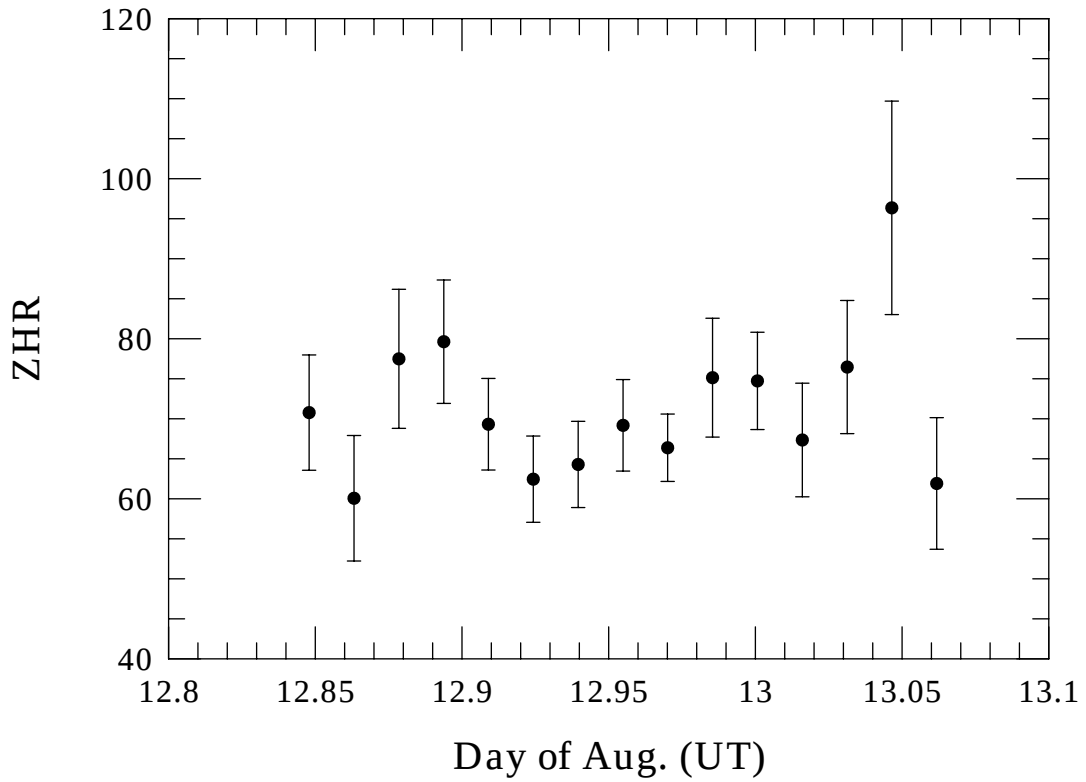

Figure 3: *The Perseid ZHR profile for* $\gamma = 1.47$.

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