The Perseids Aug 11-12, 1996 in Bulgaria

Eva Bojurova, Ivan Trukhchev

'Hristo Samsarov' 22, BG - 9000 Varna, Bulgaria

Abstract

As every year Astroclub "Canopus" organized an extended Perseid observing campaign. Members of the club took part in expeditions to Avren village near Varna, at the National Astronomical Observatory (Rojen) and at the National Youth Astronomical Camp in Belite Brezi (South Bulgaria). Here we present some results derived on the basis of data obtained by Biliana Ognianova, Diana Tisheva, Diliana Antonova, Eva Bojurova, Elena Surbinska, Irena Stavreva, Katia Koleva, Lilia Porojanova, Anton Antonov, Denis Mechmedov, Doichin Docinski, Galin Genchev, Ivan Trukhchev and Valentin Velkov. More than 2000 Perseids were recorded. Some other showers were also observed.

1 Gauging the population index of the Perseids

Table 1 shows the collective magnitude distribution of the Perseids. $N_{\rm m}$ is the number of meteors belonging to a certain magnitude class m, Φ_m is the cumulative number of meteors of the magnitude class m.

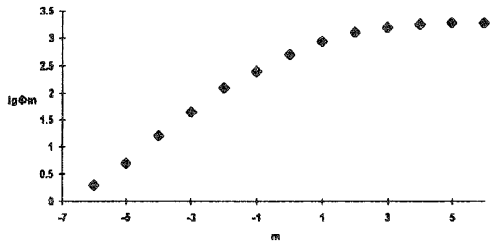

Figure 1: Magnitude distribution of the Perseids

On the Figure 1 the logarithmic cumulative magnitude distribution of the Perseids is presented. The well defined linear interval between -3$^{\rm m}$ and 0$^{\rm m}$ is used to calculate the population index r. In Table 2 the values of r calculated for three regression intervals are given.

We accepted the value r =2.0 to calculate the zenithal hourly rates of the Perseids.

Table 1: Collective magnitude distribution of the Perseids seen on Aug 11–12, 1996.

m	−6	−5	−4	−3	−2	−1	+0	+1	+2	+3	+4	+5	+6
N_m	2	3	11	29.5	81.5	125.5	262.5	383.5	438.5	328	247	81	3
Φ_m	2	5	16	45.5	127	252.5	515	898.5	1337	1665	1912	1993	1996
$\lg \Phi_m$	0.301	0.700	1.204	1.658	2.104	2.402	2.712	2.954	3.126	3.221	3.281	3.300	3.300

Table 2: Values of the population index r of the Perseids on Aug 11–12, 1996 obtained for three regression intervals. Δr is the absolute error of r and $\sigma\,[\lg \Phi_m]$ is the standard deviation.

Interval	$-3^m \ldots -1^m$	$-2^m \ldots -1^m$	$-2^m \ldots 0^m$
r	2.09	1.93	2.01
Δr	0.17	0.06	0.02
$\sigma\,[\lg \Phi_m]$	0.065	0.024	0.005

2 Determining the ZHR of the Perseids

In Figure 2 the averaged values of the ZHRs are shown for all the observers and the individual values of one of the most experienced observers, Lilia Porojanova. The averaged values of the ZHR for different intervals of time are calculated based on the individual ZHR values of different observers (different number of observers and different persons for almost each point of the graph). The relative standard deviations of some of the averaged ZHRs are up to 30%. Taking into account mainly Lilia's results we estimate that the maximum occurred around 01^h30^m UT, or $\lambda_\odot = 139\,^\circ\!.67$. This is in agreement with the tendency of the peak that precedes the main Perseid maximum to be shifted later in solar longitude each year ($\lambda_\odot = 139\,^\circ\!.45$ for 1992, $\lambda_\odot = 139\,^\circ\!.54$ for 1993, $\lambda_\odot = 139\,^\circ\!.6$ for 1994, $\lambda_\odot = 139\,^\circ\!.64$ for 1995, from the global analyses of the Perseids in WGN 20:5 (1992), 21:5 (1993), 22:6 (1994) and 23:4 (1995).

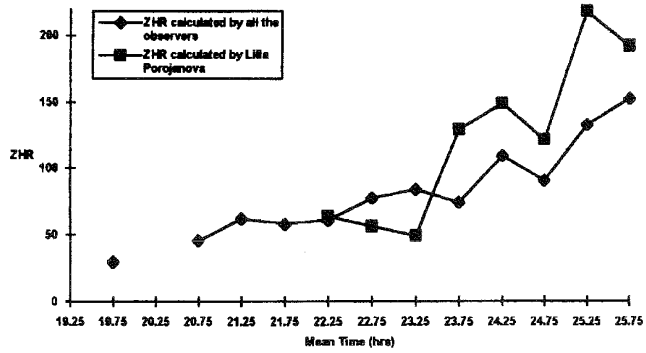

Figure 2: ZHRs of the Perseids

3 Other showers

Table 3 shows the averaged ZHR values obtained for the α-Capricornids, Cassiopeids, Northern δ-Aquarids, κ-Cygnids and the sporadic meteors on Aug 11–12, 1996.

Table 3: Other showers.

Shower	CAP	CAS	NDA	KCG	SPOR
ZHR	3.1	8.2	5.8	2.8	8.6