Ongoing meteor work

Polish Visual Meteor Database 1999–2001

Kamil Złoczewski, [1] *Michał Jurek* [2] *and Konrad Szaruga* [3]

A summary of 1999–2001 visual observations collected by the Polish Comet and Meteors Workshop is presented. In total, during 4294$^{\rm h}\!.$41 effective observing hours, 29 571 meteors were seen and plotted onto gnomonic star maps by 80 observers. The date, time, magnitude, angular velocity, and equatorial coordinates for each observed event are given. The full data for 1999–2001 as well as 1996–1998 of the Polish Visual Database (PVMDB) are accessible via Internet.

Received 2003 November 22

1 Introduction.

The Polish Comets and Meteors Workshop (CMW) has been cooperating with the International Meteor Organization (IMO) since 1994. During the first two years, we were making mostly visual observations of major showers without plotting the meteors onto gnomonic star maps. Over time the experience of our observers grew and, in 1996, we decided to start visual observations with plotting.

Every year, a complete set of our observations is sent to the IMO. In previous years it was made by mail but nowadays is made by e-mail in electronic form. They are included in the IMO Visual Meteor Database (VMDB) (see, for example (Arlt, 2000)). The VMDB contains information about hourly rates and magnitude distributions of meteor showers included in the IMO Working List of the Meteor Showers. Thus the errors made by the observers are included in the VMDB and its format gives no possibility of analysing poorly known and weak meteor showers.

The solution to the problem is a full database containing all quantities describing a meteor event including its equatorial coordinates and angular velocity. That has been already done for PVMDB 1996–1998 (Olech et al., 2000). This publication is a natural continuation of our previous work and adds three additional years to our database.

In Table 1 we summarize CMW visual work in the years 1996–2001. In total, 43 656 meteors were seen by 98 observers during 6622$^{\rm h}\!.$53 effective observing hours. Observations of the 1999–2001 database comprise 64.69 % of the whole PVMDB, which gives a better coverage of meteor activity in these years. Our database is now very attractive material for every meteor investigator and it is a potential source of many discoveries in small shower research.

Table 2 shows a full list of the CMW observers with their effective observing time and number of meteors plotted in each of the years 1999–2001.

2 Coordinates files.

The files `coor99.txt`, `coor00.txt` and `coor01.txt`, where the digits show the year, contain data for each observed meteor. These are data such as the date of appearance, meteor number, magnitude, angular velocity (in letter scale from A to F in `coor99.txt`, `coor00.txt` and numerical angular scale in `coor01.txt`), time of appearance, equatorial coordinates of the the beginning and end, IMO code of the observer and three-letter ID code. In the file `coor01.txt`, angular velocity is described in degrees per second which is due to different scales (integer and half) used by our observers since 2001.

Figure 1 shows a small sample of such a file.

The ID code shown in last column of the `coor??.txt` file is used for connecting each meteor with the information about observation stored in the `head??.txt` file. The time of appearance of a meteor, when is not given exactly in the report form, is assumed as the middle time of each observing period. All equatorial coordinates were entered using CooReader software (Samujłło & Olech, 2000); the main work was done during CMW summer observing camps.

Table 1 – The grand total of the PVMD in the years 1996–2001

Year	Observers	$T_{\rm eff}$	Meteors
1996	18	247$^{\rm h}\!.$86	1508
1997	25	849$^{\rm h}\!.$41	5269
1998	31	1230$^{\rm h}\!.$85	7308
1999	33	1595$^{\rm h}\!.$00	11262
2000	43	1647$^{\rm h}\!.$41	10932
2001	49	1052$^{\rm h}\!.$00	7377
Total	98	6622$^{\rm h}\!.$53	43656

[1] *Warsaw University Observatory, Al. Ujazdowskie 4, 00-478 Warszawa, Poland. Email:* kzlocz@astrouw.edu.pl
[2] *Academy of Mining and Metallurgy, Al. Mickiewicza 30, 30-059 Kraków, Poland. Email:* michal_jurek@poczta.onet.pl
[3] *Warsaw University Observatory, Al. Ujazdowskie 4, 00-478 Warszawa, Poland. Email:* kszar@tempac.fuw.edu.pl

Table 2 – Total effective observing time in hours ($T_{\rm eff}$) and number of meteors plotted (N) per observer during the years 1999–2001

Observer	Code	1999		2000		2001		Total	
		$T_{\rm eff}$ [h]	N	$T_{\rm eff}$ [h]	N	$T_{\rm eff}$ [h]	N	$T_{\rm eff}$ [h]	N
Dariusz Dorosz	DORDA	106.06	846	268.30	2371	140.83	1074	515.19	4291
Tomasz Fajfer	FAJTO	305.07	3139	175.50	1441	24.50	163	505.07	4743
Krzysztof Mularczyk	MULKR	184.32	998	242.73	1267	19.12	59	446.17	2324
Jarosław Dygos	DYGJA	209.43	1101	45.07	253			254.50	1354
Karolina Pyrek	PYRKA	112.41	564	133.67	600			246.08	1164
Ewa Dygos	DYGEW	99.32	595	100.77	579			200.09	1174
Konrad Szaruga	SZAKO	119.68	685	51.48	312	26.31	222	197.47	1219
Maciej Kwinta	KWIMA	70.48	538	60.24	382	38.58	429	169.30	1349
Anna Lemiecha	LEMAN			3.00	15	123.71	730	126.71	745
Piotr Nawalkowski	NAWPI	12.34	122	42.91	269	38.20	246	93.45	637
Arkadiusz Olech	OLEAR	45.18	499	13.45	108	34.75	350	93.38	957
Krzysztof Socha	SOCKR	40.50	242	4.20	0	39.08	457	83.78	699
Mariusz Lemiecha	LEMMA				752	80.00	460	80.00	1212
Andrzej Skoczewski	SKOAN	57.50	406	22.69	145			80.19	551
Wojciech Szewczyk	SZEWO			51.30	357	26.42	219	77.72	576
Aleksander Witczak	WITAL			74.51	265	2.00	4	76.51	269
Wojciech Jonderko	JONWO	2.00	5	13.95	64	45.85	248	61.80	317
Jarosław Nocoń	NOCJA	18.56	110	41.45	359			60.01	469
Krzysztof Wtorek	WTOKR			33.00		23.00	150	56.00	150
Michał Goraus	GORMI					53.06	420	53.06	420
Marta Puch	PUCMA			52.42	218			52.42	218
Piotr Szakacz	SZAPI	17.83	113	32.73	239			50.56	352
Izabela Fitoł	FITIZ	21.00	183	27.75	86			48.75	269
Mariusz Wiśniewski	WISMA	14.95	146	18.85	182	5.80	77	39.60	405
Łukasz Mikuć	MIKLU			4.10	12	31.29	252	35.39	264
Łukasz Kowalski	KOWLU					35.53	219	35.53	219
Marcin Konopka	KONMA	29.41	188					29.41	188
Konrad Lotczyk	LOTKO			25.30	116	1.83	3	27.13	119
Marcin Gajos	GAJMR	20.00	109	6.83	49			26.83	158
Łukasz Harhura	HARLU					26.13	216	26.13	216
Julita Thamm	THAJU					25.38	161	25.38	161
Rafał Michalski	MICRF					24.58	223	24.58	223
Kamil Złoczewski	ZLOKA	12.00	30	7.60	32	4.00	13	23.60	75
Tomasz Frontczak	FROTO					20.66	137	20.66	137
Aleksander Trofimowicz	TROAL	20.08	92					20.08	92
Tomasz Kowalski	KOWTO					18.41	97	18.41	97
Andrzej Kotarba	KOTAN					18.68	112	18.68	112
Dominik Stelmach	STEDM	8.65	48	8.60	42			17.25	90
Arkadiusz Witas	WITAR			15.12	57	1.42	6	16.54	63
Mateusz Kucharski	KUCMA					15.16	83	15.16	83
Artur Pilarczyk	PILAR					15.52	76	15.52	76
Mateusz Wysocki	WYSMA					14.50	82	14.50	82
Tomasz Mich	MICTF					13.05	49	13.05	49
Michał Kozak	KOZMI			13.00	36			13.00	36
Michał Jurek	JURMC	7.13	40	6.84	55			13.97	95
Łukasz Biegun	BIELU			5.79	31	7.14	26	12.93	57
Mariola Czubaszek	CZUMA	11.96	127					11.96	127
Magdalena Gawlas	GAWMA			4.34	12	6.77	28	11.11	40
Luiza Wojciechowska	WOJLU	11.50	68					11.50	68
Cezary Gałan	GALCE	10.17	69					10.17	69
Beata Czmut	CZMBE	10.50	61					10.50	61
Łukasz Kamiński	KAMLU					9.17	219	9.17	219
Robert Sołtys	SOLRO	7.50	87					7.50	87
Piotr Łasiński	LASPI			7.00	48			7.00	48
Łukasz Sanocki	SANLU	2.97	13	4.43	34			7.40	47
Anna Pachołek	PACAN			7.21	18			7.21	18
Dominik Gawlas	GAWDO			4.08	35	2.10	19	6.18	59
Mirosław Bogusz	BOGMI					5.50	43	5.50	43
Anna Puzio	PUZAN					5.82	39	5.82	39
Sławomir Witas	WITSL			4.45	15			4.45	15
Mirosław Należyty	NALMI			4.05	41			4.05	41
Michał Marek	MARMI					4.92	25	4.92	25
Marcin Klimczak	KLIMA					3.50	15	3.50	15
Łukasz Remiszewski	REMLU					3.84	13	3.84	13
Krzysztof Dwork	DWOKR					3.00	17	3.00	17
Karol Kania	KANKR					3.00	6	3.00	6
Gabriel Wlazłowski	WLAGA	3.00	6					3.00	6
Dorota Pietruszko	PIEDO			3.41	21			3.41	21
Piotr Masoń	MASPI					2.00	8	2.00	8
Maciej Reszelski	RESMA	1.50	13			1.20	11	2.70	24
Łukasz Woźniak	WOZLU					2.02	14	2.02	14
Jan Bielicki	BIEJA					2.00	12	2.00	12
Anna Witas	WITAN			2.41	6			2.41	6
Wojciech Kosiarek	KOSWO					1.25	18	1.25	18
Urszula Gawlas	GAWUR			1.58	3			1.58	3
Katarzyna Skoczewska	SKOKA			1.30	6			1.30	6
Katarzyna Bożek	BOZKA	1.00	15					1.00	15
Grzegorz Calek	CALGR					1.02	3	1.02	3
Gracjan Maciejewski	MACGR	1.00	4					1.00	4
Krzysztof Łoś	LOSKR					0.40	1	0.40	1
Total		1595.00	11262	1647.41	10932	1052.00	7377	4294.00	29571

3 Header files.

The files `head99.txt`, `head00.txt` and `head01.txt` contain information about each observing run, such as the ID code allowing one to connect each observing period with data on meteors presented in the coordinates files, IMO code of observer, longitude and latitude of place of observation, date, UT time of beginning and end of observation, solar longitude (interpolation based on tables published by IMO) of the middle time of each run, equatorial coordinates of observed field, effective time of observation, cloud correction factor F, stellar limiting magnitude estimated by the naked eye and the IMO code of the place of observation.

Figure 2 shows a small sample of such file.

4 Summary.

We have presented a summary of the 1999–2001 visual observations made by CMW. In total, 29 571 meteors were observed during $4294^{\mathrm{h}}.410$ effective observing hours collected by 80 observers. The date, time, magnitude, angular velocity, and equatorial coordinates for each observed event are given. The full data for 1999–2001 in the Polish Visual Database (PVMDB) with data format description is accessible via Internet at `http://www.astrouw.edu.pl/~olech/VIS/` or `http://www.pkim.org/pliki.shtml`.

The 2002–2003 visual data are still under review and will be published soon.

Acknowledgments

We would like to thank all the observers who sent their observations and all the participants of CMW summer camps who spent hundreds of hours working with CooReader. This work was supported by KBN grant 2 P03D 003 25 to K. Mularczyk.

References

Arlt R. (2000) "1999 Visual Meteor Observations", *WGN Report Series*, **12**.

Olech A., Wiśniewski M. and Gajos M. (2000) "Polish Visual Meteor Database 1996–1998", *WGN* **29:6**, 214–217.

Samujłło M. and Olech A. (2000) "Cooreader — the First Results and the Outburst of June Boötids.", Proc. 1999 International Meteor Conference, Stara Lesna, Slovakia, Arlt, R. & Knöfel, A. (eds.), IMO, Potsdam, Germany, 65–68.

```
2001 01 01/02 001   0.0 17 20:52 059.24  -12.58 054.09  -15.31 LEMMA IDA
2001 01 01/02 002   3.0 17 20:52 047.63   28.42 050.02   21.54 LEMMA IDA
2001 01 12/13 001   3.0 15 19:30 087.62   11.60 087.38   07.64 LOTKO IDB
2001 01 12/13 002   3.5 10 19:30 080.36   11.70 084.28   12.18 LOTKO IDB
2001 01 12/13 003   1.0 10 19:30 076.81   09.82 067.43   05.29 LOTKO IDB
2001 01 17/18 001   0.5 15 21:03 080.76   26.84 075.08   11.22 SZEWO IDC
2001 01 17/18 002   1.5 05 21:03 111.30   20.76 108.52   21.10 SZEWO IDC
2001 01 19/20 001   4.0 30 03:35 140.53   46.13 133.51   45.45 DORDA IDD
2001 01 19/20 002   4.0 30 03:35 171.76   56.76 160.68   63.95 DORDA IDD
2001 01 19/20 003   4.5 20 03:35 114.53   49.96 110.94   48.61 DORDA IDD
```

Figure 1 – A small sample of a coordinate file.

```
IDA LEMMA  22.6 E 51.8 N 01 01 01 2020 2125 281.515 075  30 1.00 1.00 6.70 34078
IDB LOTKO  20.9 E 52.0 N 12 01 01 1855 2008 292.622 090  15 1.83 1.00 5.80 34079
IDC SZEWO  18.7 E 50.0 N 17 01 01 2047 2120 297.779 098  00 0.50 1.00 5.30 34080
IDD DORDA  18.8 E 54.6 N 20 01 01 0305 0410 300.094 135  45 1.00 1.00 6.80 34074
IDE LEMMA  22.6 E 51.8 N 23 01 01 1840 1942 303.807 068  30 1.00 1.00 6.60 34078
IDF LEMMA  22.6 E 51.8 N 23 01 01 2000 2032 303.895 068  30 1.00 1.00 6.70 34078
IDG LEMAN  22.6 E 51.8 N 24 01 01 1900 2005 304.840 124  62 1.00 1.00 6.70 34078
IDH LEMAN  22.6 E 51.8 N 24 01 01 2050 2155 304.917 124  62 1.00 1.00 6.70 34078
IDI LEMAN  22.6 E 51.8 N 24 01 01 2230 2315 305.023 124  62 0.67 1.00 6.80 34078
IDJ LEMMA  22.6 E 51.8 N 24 01 01 1900 2005 304.840 113  30 1.00 1.00 6.60 34078
```

Figure 2 – A small sample of a header file.