EPSC Abstracts
Vol. 9, EPSC2014-732, 2014
European Planetary Science Congress 2014

Polish Fireball Network

M. Wiśniewski (1,2), P. Żołądek (1), A. Olech (1,3), Z. Tyminski (1,4), M. Maciejewski (1), K. Fietkiewicz (1), P. Zaręba (1), M. Gozdalski (1), T. Krzyżanowski (1), M. Myszkiewicz (1), M. Krasnowski (1), K. Polakowski (1)
(1) Polish Fireball Network, Comets and Meteors Workshop, ul. Bartycka 18, 00-716 Warsaw, Poland
(2) Central Office of Measures, ul. Elektoralna 2, 00-139 Warsaw, Poland
(3) Nicolaus Copernicus Astronomical Center, ul. Bartycka 18, 00-716 Warsaw, Poland
(4) National Centre of Nuclear Research RC POLATOM, Soltan 7, Otwock-Świerk, Poland
(marand.w@gmail.com)

Abstract

The PFN started in March 2004. Most of its observers are amateurs, members of Comets and Meteors Workshop. The network consists of 27 continuously working stations, where 56 sensitive CCTV video cameras and 3 DSLR Canon photo cameras with wide angle lenses operate. We create the PyFN software for trajectory and orbit calculation.

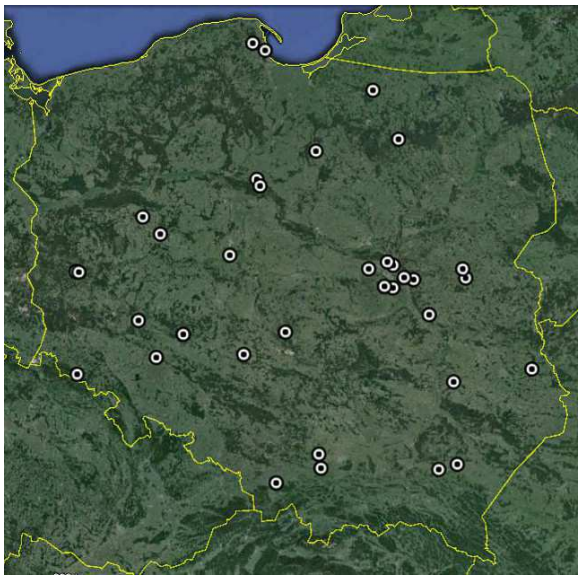

Figure 1: Positions of Polish Fireball Network video and photographic stations

1. Introduction

The Polish sky has been patrolled for eight years by cameras of Polish Fireball Network (PFN). The PFN started in March 2004 with 3 continuously operating video stations in Ostrowik (PFN01), Złotokłos (PFN03) and Poznań (PFN05). Most of PFN observers are amateurs, members of Comets and Meteors Workshop and perform observations from their homes. Some stations are located in astronomical clubs and schools [1].

Table 1: List of PFN stations

ID	Name	Equipment 3
PFN01	Ostrowik	occasional site
PFN03	Złotokłos	PAVO3, PAVO4
PFN04	Warszawa2	occasional site
PFN05	Poznań	PAVO5, PAV11, PAV24
PFN06	Kraków1	PAVO6, PAVO7
PFN13	Toruń	PAV14
PFN14	Zielona Góra	PAV17, PAV18, PAV19
PFN17	Gdynia	PAV20, PAV21
PFN19	Kobiernice	PAVO8
PFN20	Urzędów	PAV25, PAV26, PAV38
PFN23	Warszawa3	PAV13
PFN24	Gniewowo	PAV12, PAV16, FOTO
PFN27	Burzenin	PAV31, PAV32
PFN28	Warszawa4	FOTO
PFN30	Wrocław	PAV33, PAV34
PFN31	Szamotuły	PAV28, PAV29, PAV30
PFN32	Chełm	PAV35, PAV36, PAV43
PFN35	Białków	PAV39, PAV40
PFN37	Nowe Miasto Lubawskie	PAV41
PFN38	Podgórzyn	PAV44, PAV49, PAV50
PFN40	Otwock	PAVO9, PAV52,
PFN41	Twardogóra	PAV45, PAV53
PFN42	Błonie	PAV47, PAV48, PAV55
PFN43	Siedlce	PAV27, PAV61, FOTO
PFN44	Wałpusz	PAV51
PFN45	Łańcut	PAV37, PAV56
PFN46	Grabnik	PAV57
PFN47	Jeziorko	PAV13, PAV62, PAV63, PAV65
PFN48	Rzeszów	PAV59
PFN49	Helenów	PAV23,

Figure 2: PF191012 Myszyniec fireball captured by all sky photographic camera at station PFN43.

The project also involved the Warsaw University Astronomical Observatory (OAUW), the Nicolaus Copernicus Astronomical Center (NCAC) and the National Centre of Nuclear Research RC POLATOM

2. Current status of PFN

The network consists of 27 continuously working stations, where 56 video cameras and 3 digital photo cameras operate. Map of PFN is presented on Figure 1. Detailed information about PFN stations is combined in Table 1.

We use sensitive CCTV video cameras. Most of cameras are equipped with CCTV lenses with a focal length f = 4 mm and F/1.2 what gives 65.6×49.2° field of view. Typical resolution of 5 minutes per pixel. Limiting magnitude of the system is +2 magnitude for meteors [1]. We use MetRec [2] software and UFOCapture[3] software for meteor detection. RecoStar and UFOAnnalyzer software are used for astrometric reduction of video recordings.

Photographic equipment is based on standard DSLR Canon cameras with wide angle lenses. All cameras work with shutter which produce brakes in meteor images for velocity estimation. Using this setup, on the night of Oct 18/19, 2012, at 00:23 UT, we recorded a −14.7 mag fireball – the highest Orionid meteor ever recorded [4] (see Figure 2).

Detections from all cameras are automatically transmitted via internet to central server where double station events are detected, analysed and then trajectory and obit is determined. All calculations are checked by manual inspection.

We create the PyFN software for trajectory and orbit calculation. PyFN utilizes the Celpeha method described in [5].

Our Meteorite Section is the only group in Poland specialized in searching of meteorites with tested and validated methods of exploration. The main task of the Section is to find the meteorites dropped from bolides registered by Polish Fireball Network and offer them for free as the research material for the scientific institutions.

3. Summary and Conclusions

Combination of sensitive video cameras and photographic cameras allows us to record with good accuracy both, large number of faint meteors and unsaturated fireballs. We are preparing to setup new high resolution video and spectroscopic systems .

This work was supported by the National Science Center (decision No. DEC-2013/09/B/ST9/02168)

References

[1] A. Olech, P. Zoladek, M. Wisniewski, Krasnowski M., M. Kwinta, T. Fajfer, K. Fietkiewicz, D. Dorosz, L. Kowalski, J. Olejnik, K. Mularczyk, and K. Zloczewski. Polish Fireball Network. In L. Bastiaens, J. Verbert, and J.-M. V. C. Wislez, editors, Proceedings of the International Meteor Conference, Oostmalle, Belgium, pages 53–62, August 2006.

[2] S. Molau. The meteor detection software MetRec. In W. J. Baggaley and V. Porubcan, editors, Meteroids 1998, pages 131–+, 1999.

[3] SonotaCo (2005). “UFCaptureV2 Users Manual”. http://sonotaco.com/soft/UFO2/help/english/index.html .

[4] Olech et al. 2013, A&A, Volume 557, id.A89, 5 pp.

[5] Z. Ceplecha. Geometric, dynamic, orbital and photometric data on meteoroids from photographic fireball networks. Bulletin of the Astronomical Institutes of Czechoslovakia, 38:222–234, July 1987.