THE PLEIADES PLATE DATABASE: A NEW UPDATE

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New results for the Pleiades Plate Database (PPDB) are presented. The database aims to collect information for the digitized Pleiades plates mainly in the field of 25 square degrees around Alcyone. Using the Wide-Field Plate Database (WFPDB, [`http://www.skyarchive.org`]) for the Pleiades plate search we found more than 3100 plates existing in the Asiago, Sonneberg, Harvard, Kyiv, and Moscow plate collections. The Pleiades cluster as one of the most observed stellar cluster, which is quite well visible in the Northern sky, is a basic one for many astronomical projects, carried out since the beginning of systematical photographic sky monitoring in 1872 (the Gould survey). More plates from the Asiago, Sonneberg, Harvard, Kyiv, and Moscow wide-field plate archives were scanned and added to the database.

INTRODUCTION

The search for slow and low amplitude brightness variations in K and M dwarf stars needs the long term observations. Bondar' [1] used the plate collections of the Moscow University, the Odesa and Sonneberg observatories and found at some dKe–dMe stars mean brightness variations from 0.3 to 1.0 mag with characteristic times from 3 up to 60 years. The access to the information on all wide-field photographic observations, performed during the 100-year period of photographic astronomy, as well as on the available digitized archived observations is organized and provided by the Wide-Field Plate Database (WFPDB, Tsvetkov *et al.* [7, 8]). The Pleiades cluster as one of the most observable objects gives a good possibility to check the behaviour of low mass stars for a period of about 100 years. Some characteristics of the cluster can be found in the recent paper by Kharchenko *et al.* [6]. There are 547 discovered flare stars, which shown 1635 flare-ups for the observing times more than 3200 h in the Pleiades region (Tsvetkova *et al.* [9]). Their long term behaviour, as well as the behaviour of other red dwarf Pleiades stars is of special interest for the stellar evolution. Using the WFPDB Borisova *et al.* [2, 3] began the creation of the Pleiades Plate Database (PPDB) in order to use the photographic observations for study of long term brightness variations of the red dwarf Pleiades stars.

NEW PPDB INPUT

Since the last work by Borisova *et al.* [3] the Pleiades Plate Database was updated mainly due to the incoming data from the Asiago Astrophysical Observatory [http://www.pd.astro.it/asiago];
from the second largest world plate collection in Sonneberg [http://www.stw.tu-ilmenau.de];
from the largest plate collection in Harvard [http://tdc-ww.harvard.edu/plates/ldi2002/img15.html];
from the Main Astronomical Observatory in Kyiv [http://www.mao.kiev.ua],
and from INASAN and SAI in Moscow [http://www.sai.msu.ru]. The newly included Pleiades plates are presented in Table 1. The large number of the Pleiades plates in Asiago and Sonneberg can be explained with the flare stars monitoring carried out at these observatories. According to the information in the WFPDB, most of the plates were obtained in *UBVRI* colour band. Table 2 provides types and characteristics of scanners used for plate digitization. It deserves to mention that the same type of a flatbed scanner, namely Epson 1640XL, is used in Germany and Armenia too.

Table 1. New Pleiades Plates in the PPDB

Observatory / Instrument	Number of Existing Plates	Period
Asiago 67 cm Schmidt	687	1960–1980
Asiago 40 cm Schmidt	182	1958–1991
Sonneberg Tessar cameras	1298	1957–1963
Sonneberg 50 cm Schmidt	431	1952–1993
Harvard Gould Plates	11	1872–1881
Harvard A series	47	1893–1934
Harvard MC series	100	1909–1963
Harvard MF series	100	1917–1931
Kyiv DWA	240	1950–1996
Moscow INASAN–SAI	20	1893–1904

Table 2. Used scanners

Observatory	Type of scanner	Resolution mic/pxl	Format	Average plate volume (MB)
Asiago	Epson 1640XL	16	FITS	250
Sonneberg	HP 2400	20	TIFF	100
SSADC (for Kyiv)	EPSON 1640XL	16	FITS	650
Moscow INASAN–SAI*	EPSON 1640XL	16	FITS	650
Harvard	UMAX 3000PL	16	FITS	110

* Note: Since May 2004

Table 3. Characteristics of the scanned plates

Observatory	Number of Scanned Plates	Plate size (cm)	Volume of Information (GB)
Asiago	39	20×20	20
Sonneberg	1200	13×13	120
Harvard (Gould Plates*)	11	9×13	2
Kyiv	18	30×30	8
Moscow	4	30×30	3

* Note: The oldest plates of the Pleiades star field (Gould 1897, Hazen 1991).

The number of the scanned Pleiades plates, their sizes and volumes of the digital information are given in Table 3. Figure 1 shows the central part of a Pleiades plate from Kyiv (KIE040C000393) taken by N. Vasilenko on October 29, 1976 on ORWO-ZU2 (pg) emulsion with a 60 minute exposure. The plate is scanned with the SSADC EPSON 1640XL flatbed scanner with 1600 dpi resolution in fits format.

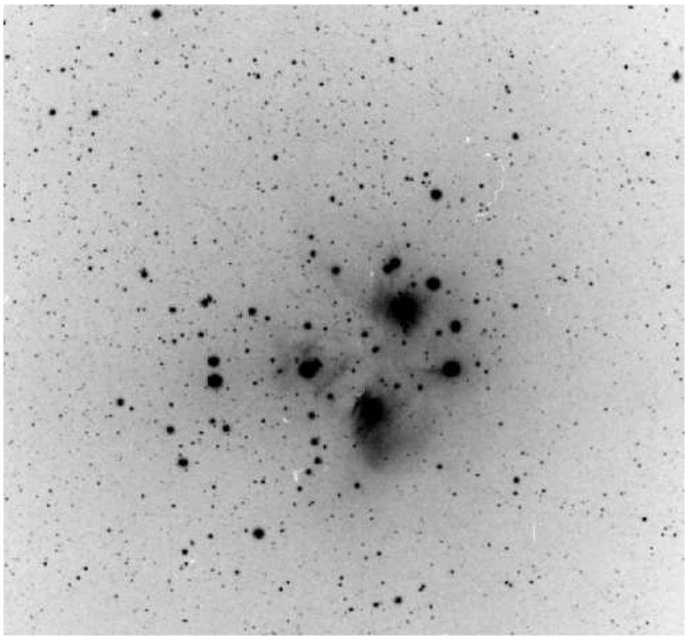

Figure 1. The central part of the Pleiades plate from Kyiv (KIE040C000393), taken on October 29, 1976. This is a 60 minute exposure on ORWO-ZU2 (pg) emulsion. (Observer N. Vasilenko)

CONCLUSIONS

In the frame of the international cooperation an updated information on the digitized Pleiades plates (about 150 GB) is collected. The most used scanner in the collaborating observatories is the flatbed scanner EPSON 1640XL. CCD preview imaging of the Pleiades plates is recommended, if an observatory does not possess a flatbed scanner. A new information on the Pleiades plates from the observatories in Brussels, Toulouse, and Uppsala is expected. This project will be linked to IVOA, AVO, GAVO with on-line access to the data installed on the SSADC server.

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