

WIDE-FIELD PLATE DATABASE: INCLUDED UKRAINIAN PLATE CATALOGUES

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Abstract. The last version of the Wide-Field Plate Database Catalogue of Wide-Field Plate Archives (April 2008) contains 43 archives stored in observatories located in Ukraine - Crimean Astrophysical Observatory (Nauchny and Simeiz), Kyiv University Observatory, L'viv University Observatory, Main Astronomical Observatory of the National Academy of Sciences of Ukraine (Golosiiv), Nikolaev Observatory and Odessa University Observatory. About 126 000 plates were obtained in the period 1898 - 2005 in the frames of the observing programmes: Small Solar System Bodies Observations, Observations of Variable Stars, Investigations of the Emission Nebulae and Connected Stars, Spectral Classification of the Stars and Determination of the Stellar Absorption in the Direction of the Emission Nebulae, Photographic Survey of the Northern Sky (FON), Investigation of the Kinematics and the Structure in the Main Meridian Section of the Galaxy (MEGA), Selection of Reference Stars, Artificial Satellites Observations. Up to the moment the basic information for 13 plate catalogues of the Main Astronomical Observatory (Golosiiv, Kyiv) and Crimean Astrophysical Observatory (Nauchny and Simeiz) is included into the Wide-Field Plate Database Catalogue of Wide-Field Plate Indexes with 12609 plates. The plate digitization is just started with flatbed scanners. Illustrations of the Ukrainian plate archives potential for future re-usage, as well as of some ready plate catalogues on the basis of data retrieval from the Wide-Field Plate Database are present.

1. INTRODUCTION

The up-dated version of the Catalogue of Wide-Field Plate Archives from April 2008 (CWFPAs, Tsvetkova and Tsvetkov 2005), which is a part of the Wide-Field Plate Database (WFPDB, <http://www.skyarchive.org>) contains 43 archives stored in observatories located in Ukraine - Crimean Astrophysical Observatory (Nauchny and Simeiz), Kyiv University Observatory, L'viv University Observatory, Main Astronomical Observatory of the National Academy of Sciences of Ukraine (Golosiiv, Kyiv), Nikolaev Observatory and Odessa University Observatory. Except the archives made with their own telescopes some of the observatories store plate archives made in other observatories, e.g. in Nikolaev Observatory - a plate archive made in Pulkovo Observatory (Russia); in Odessa University Observatory - the old Simeiz Observatory plate archive; in Main Astronomical Observatory - archives from Byurakan (Armenia), Quito Observatory (Ecuador), Quito Comet Station (Ecuador), Tashkent Observatory - Kitab Station (Uzbekistan). About 126 000 plates were obtained in the period 1898 - 2005 in the frames of the observing programmes: Small Solar System Bodies Observations, Investigations of the Emission Nebulae and Connected Stars, Spectral Classification of the Stars and Determination of the Stellar Absorption in the Direction of the Emission Nebulae, Photographic Survey of the Northern Sky (Fotografichny Ohlyad Neba, FON), Investigation of the Kinematics and the Structure in the Main Meridian Section of the Galaxy (MEGA), Selection of Reference Stars, Artificial Satellites Observations.

2. WFPDB: UKRAINIAN PLATE ARCHIVES

The information about the used telescopes and 43 Ukrainian wide-field plate archives sorted by the observatory, where they are stored, is given in Table 1 and Table 2 as an excerpt from the CWFPAs (April 2008).

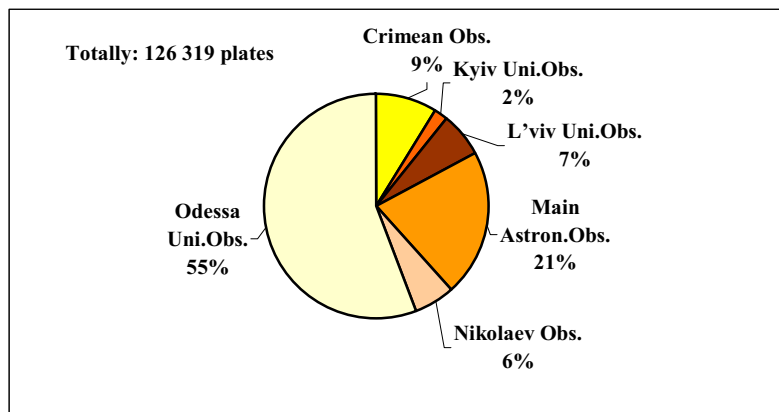


Figure 1: Ukrainian observatories plate collections.

Table 1. Wide-field telescopes used

WFPDB Identifier	Telescope		Focal Length(m)	Scale "/mm	Field (deg)	Years of Operation
	Type	Apert.(m)				
CRI017A	Cam	0.17	0.75	276	13	1948-1965
CRI017B	Cam	0.17	0.75	276	13	1951-1953
CRI040A	Ast	0.4	1.60	129	10	1947-1948
CRI040B	Ast	2x0.4	1.60	129	10	1951-1965
CRI040C	Ast	2x0.4	1.60	129	10	1963-1998
BYU053	Sch	0.53/0.53	1.83	113	5	1985-1985
EAO040B	Ast	0.4	2.00	103	9	1982-1993
GUA010A	Ast	0.1	0.50	412	20	1957-1961
GUA010B	Ast	0.1	0.50	412	20	1957-1961
GUA011A	Ast	0.11	1.20	172	8	1955-1957
GUA011B	Ast	0.11	1.20	172	8	1955-1957
GUA012A	Ast	2x0.12	0.70	295	20	1949-1990
GUA012B	Ast	2x0.12	0.70	295	20	1949-1978
GUA015	Ast	0.15	1.70	121	6	1955-1961
GUA040A	Ast	2x0.4	5.50	38	3	1949-1986
GUA040B	Ast	2x0.4	5.50	38	3	1949-1986
GUA040C	Ast	2x0.4	2.00	103	8	1976-1998
GUA040D	Ast	2x0.4	2.00	103	8	1976-1997
GUA040E	Ast	2x0.4	2.00	103	6	1981-2005
GUA070	Rfl	0.7	3.15	66	1	1960-1973
QUI021A	Cam	0.21	0.74	281	16	1986-1986
QUI021B	Cam	0.21	0.74	281	16	1986-1986
TAS040A	Ast	2x0.4	3.00	69	6	1981-1989
TAS040B	Ast	2x0.4	3.00	69	6	1981-1989
KYI020	Ast	0.2	0.43			1898-2004
LAO010	Ast	0.10	0.50	412	19	1939-1976
MYK012	Ast	0.12	2.04	101	5	1961-1999
PUL012	Ast	0.12	2.04	101	5	1929-1931
CRI012	Ast	0.06	0.12		30	1945-1957
ODE006A	Ast	0.06	0.12		30	1945-1957
ODE006B	Ast	0.06	0.12		30	1945-1957
ODE007	Ast	0.07	0.30		30	1945-1957
ODE010A	Ast	0.1	0.50		22	1945-1957
ODE010B	Ast	0.1	0.50		22	1945-1957
ODE010C	Cam	0.1	0.25	288	35	1957-1990
ODE010D	Cam	0.1	0.25	288	34	1957-1990
ODE010E	Cam	0.1	0.25	288	25	1957-1990
ODE010F	Cam	0.1	0.25	288	12	1957-1990
ODE010G	Cam	0.1	0.25	288	12	1957-1990
ODE010H	Cam	0.1	0.25	288	22	1957-1990
ODE010I	Cam	0.1	0.25	288	18	1957-1990
ODE015	Ast	0.15	1.00	204	12	1945-1957
ODE020	Sch	0.2/0.4		474	6	1969-1980

Table 2. Ukrainian wide-field plate archives

WFPDB Identifier	Archive Location	Observatory	Years of Operation	Plate Number Direct Spectral	
CRI017A	Crimea	Crimean Obs.–Simeiz	1948-1965	516	54
CRI017B	Crimea	Crimean Obs.–Nauchny	1951-1953	49	
CRI040A	Crimea	Crimean Obs.–Simeiz	1947-1948	59	159
CRI040B	Crimea	Crimean Obs.–Nauchny	1951-1965	215	296
CRI040C	Crimea	Crimean Obs.–Nauchny	1963-1998	9781	
BYU053	Kyiv	Byurakan, Armenia	1985-1985	28	
EAO040B	Kyiv	Zelenchuk, Russia	1982-1993	142	
GUA010A	Kyiv	Main Astron. Obs., Kyiv	1957-1961	438	
GUA010B	Kyiv	Main Astron. Obs., Kyiv	1957-1961	277	
GUA011A	Kyiv	Main Astron. Obs., Kyiv	1955-1957	35	
GUA011B	Kyiv	Main Astron. Obs., Kyiv	1955-1957	55	
GUA012A	Kyiv	Main Astron. Obs., Kyiv	1949-1990	2041	7
GUA012B	Kyiv	Main Astron. Obs., Kyiv	1949-1978	2143	
GUA015	Kyiv	Main Astron. Obs., Kyiv	1955-1961	162	
GUA040A	Kyiv	Main Astron. Obs., Kyiv	1949-1986	9500	
GUA040B	Kyiv	Main Astron. Obs., Kyiv	1949-1986	1000	
GUA040C	Kyiv	Main Astron. Obs., Kyiv	1976-1998	4276	
GUA040D	Kyiv	Main Astron. Obs., Kyiv	1976-1997	1834	
GUA040E	Kyiv	Main Astron. Obs., Kyiv	1981-2005	3657	
GUA070	Kyiv	Main Astron. Obs., Kyiv	1960-1973	566	
QUI021A	Kyiv	Quito Obs., Ecuador	1986-1986	100	
QUI021B	Kyiv	Quito Comet Station	1986-1986	50	
TAS040A	Kyiv	Tashkent Obs., Kitab	1981-1989	96	
TAS040B	Kyiv	Tashkent Obs., Kitab	1981-1989	5	
KYI020	Kyiv	Kyiv University Obs.	1898-2004	2401	
LAO010	L'viv	L'viv University Obs.	1939-1976	8339	
MYK012	Mykolayiv	Nikolaev Obs.	1961-1999	7438	
PUL012	Mykolayiv	Pulkovo Obs., Russia	1929-1931		
CRI012	Odessa	Crimean Obs.–Simeiz	1909-1953	6900	
ODE006A	Odessa	Odessa	1945-1957	2000	
ODE006B	Odessa	Odessa	1945-1957	2000	
ODE007	Odessa	Odessa	1945-1957	2000	
ODE010A	Odessa	Odessa	1945-1957	2000	
ODE010B	Odessa	Odessa	1945-1957	2000	
ODE010C	Odessa	Odessa	1957-1990	7100	
ODE010D	Odessa	Odessa	1957-1990	7100	
ODE010E	Odessa	Odessa	1957-1990	7100	
ODE010F	Odessa	Odessa	1957-1990	7100	
ODE010G	Odessa	Odessa	1957-1990	7100	
ODE010H	Odessa	Odessa	1957-1990	7100	
ODE010I	Odessa	Odessa	1957-1990	7100	
ODE015	Odessa	Odessa	1945-1957	2000	
ODE020	Odessa	Odessa	1969-1980	2000	

According to Fig. 1 where the contents of every Ukrainian observatory plate collection is given in percentage of the total number of the Ukrainian wide-field plates (126 319), more than the half of all plates is stored in Odessa University Observatory.

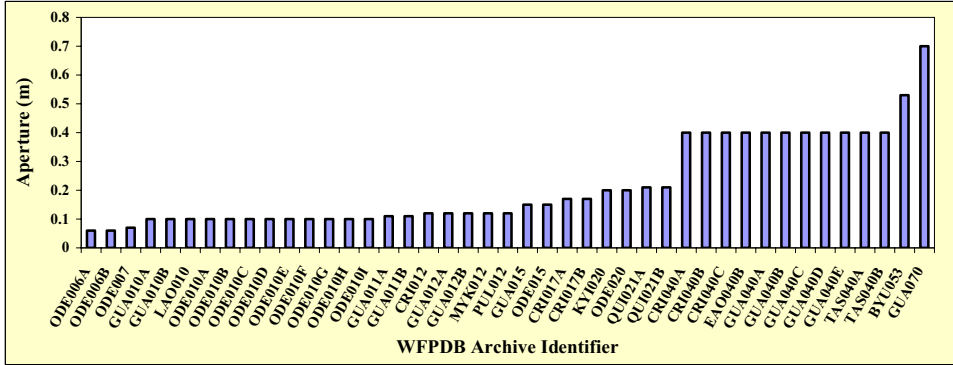


Figure 2: Plate archive distribution versus the used telescope aperture.

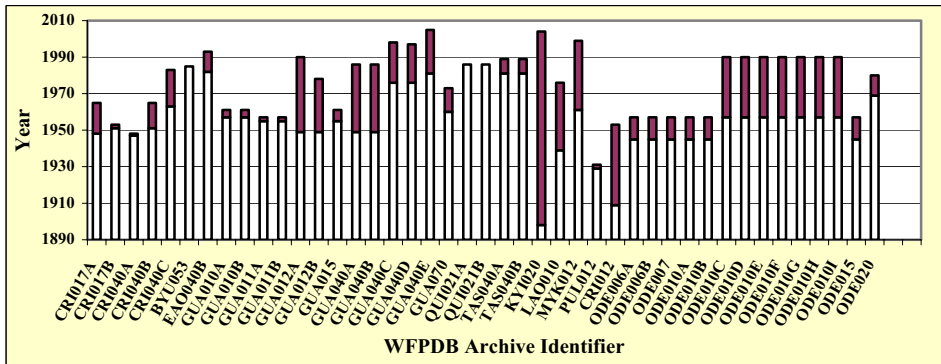


Figure 3: Time coverage of the plate archives.

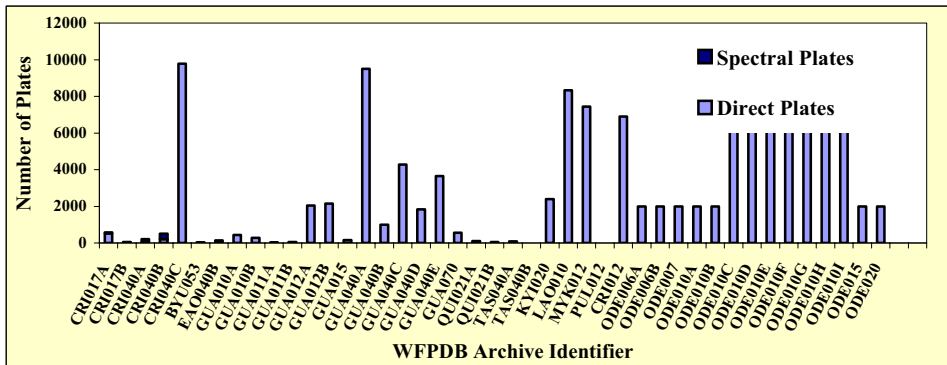


Figure 4: Plate archive distribution versus number of plates.

The distribution of the used telescope aperture, the time covered, as well as the distribution of the number of plates versus the WFPDB identifier of the Ukrainian plate archives, is presented in Figs. 2 – 4. Mainly small telescopes were used for plate observations with the limiting stellar magnitude up to 16-17, the time coverage is between 1898 (in Kyiv University Observatory) – 2005 (in Main Astronomical Observatory). The plates are mainly direct ones – the spectral plates are less than 0.5%.

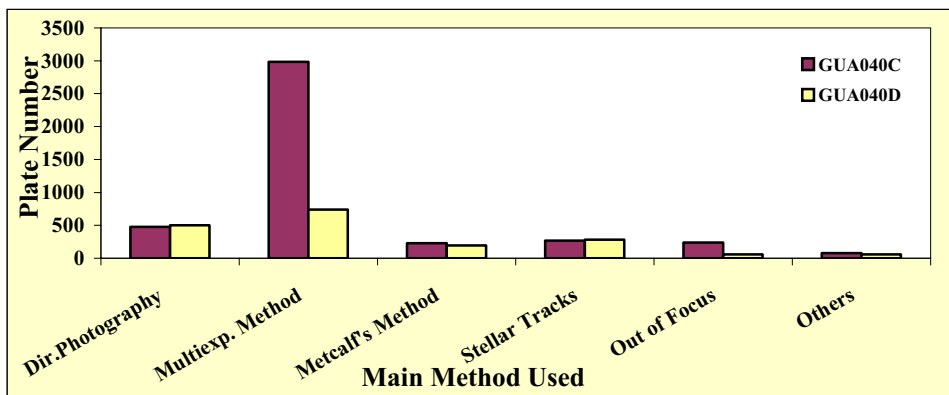


Figure 5: GUA040C and GUA040D plate number versus method used.

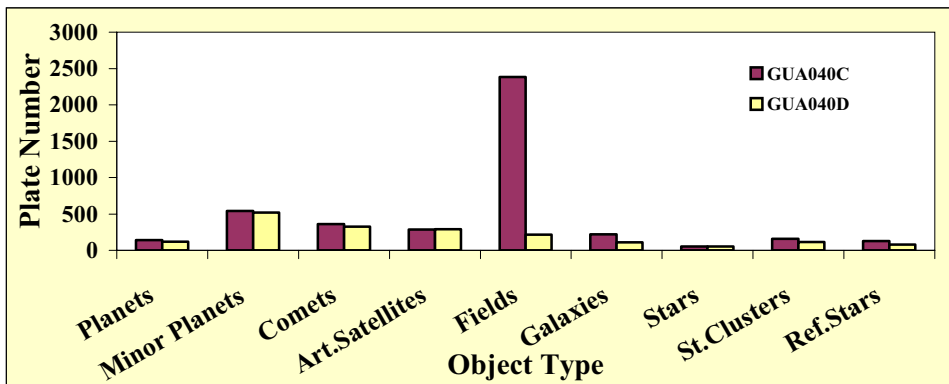


Figure 6: GUA040C and GUA040D plate number versus object type.

3. HOW THE INFORMATION FOR THE INCLUDED UKRAINIAN PLATE CATALOGUES AND THEIR CONTENTS CAN BE FOUND IN THE WFPDB

In the WFPDB – Sofia Search Page (<http://www.skyarchive.org>) the descriptive information for every archive, as well as for every plate of the respective catalogue can be found using the WFPDB archive/instrument identifier. This identifier is composed by the name of the observatory (for the Crimean Observatory – CRI,

Kyiv University Observatory – KYI, L'viv University Observatory – LAO, Main Astronomical Observatory – GUA, Nikolaev Observatory – MYK, and Odessa University Observatory – ODE), respective instrument aperture, instrument aperture suffix (in the case with existing instruments with the same aperture) plus the original plate number. One can find more details for the location of the archives, for the observatory, for the parameters of the telescope, and the period of its operation, the coordinates of the plate center in epoch 2000.0, the date and beginning of the observation in UT, object name and type, method of observation, number of exposures and their duration, type of emulsion, filter and spectral band, the size of the plate, the quality of the plate, some notes with specific contents, the name of the observer, the place of plate storage (availability) and the status of plate digitization, as well as the name of astronomer in charge for contact.

Up to April 2008 the basic plate information for the contents of 13 plate catalogues of the Main Astronomical Observatory and Crimean Astrophysical Observatory (Nauchny and Simeiz) is included into the Catalogue of Wide-Field Plate Indexes – all together for 12609 plates obtained in the period 1948-1998 (Table 3).

Table 3. Ukrainian wide-field plate catalogues included in the WFPDB

WFPDB Identifier	Plate Storage in	Time Coverage	Number of Plates	Astronomer in Charge
CRI017A	Crimean Obs.-Simeiz	1948-1965	570	N.Bondar'
CRI017B	Crimean.Obs.-Nauchny	1951-1953	49	N.Bondar'
CRI040A	Crimean Obs.-Simeiz	1947-1948	218	N.Bondar'
CRI040B	Crimean Obs.-Nauchny	1951-1965	511	N.Bondar'
GUA010A	Main Astron. Obs.	1957-1961	438	V.Golovnya
GUA010B	Main Astron. Obs.	1957-1961	277	V.Golovnya
GUA011A	Main Astron. Obs.	1955-1957	35	V.Golovnya
GUA011B	Main Astron. Obs.	1955-1957	55	V.Golovnya
GUA012A	Main Astron. Obs.	1949-1990	2041	L.Kizyun
GUA012B	Main Astron. Obs.	1949-1978	2150	L.Kizyun
GUA015	Main Astron. Obs.	1955-1961	162	V.Golovnya
GUA040C	Main Astron. Obs.	1976-1998	4276	V.Golovnya
GUA040D	Main Astron. Obs.	1976-1997	1834	E.Yizhakevych

On the basis of data retrieval from the WFPDB illustrations of the potential for future plate re-usage of two catalogues (with WFPDB identifiers GUA040C and GUA040D) are present in Figs. 5 – 7. More details for these catalogues are given in Tsvetkova et al. (2007). The plates were obtained with the 0.40m Double Wide-angle Astrograph (DWA) of the Main Astronomical Observatory. For the both tubes of the telescope the number of plates is respectively 4276 and 1834. These plates were the basis for determination of positions, proper motions and photometric data for more than 2,000,000 stars from the FON Astrographic Catalogue (FONAC), as well as for determination of the absolute proper motions for more than 14,000 stars. This observing programme reflects the main observing method

used (multi-exposure method), as well as the type of objects observed – in this case “Fields”. The all-sky distribution of the plate centers for every included into the WFPDB catalogue can be found at the WFPDB – Sofia Search Page (in Fig. 7 one can see it for GUA040C catalogue).

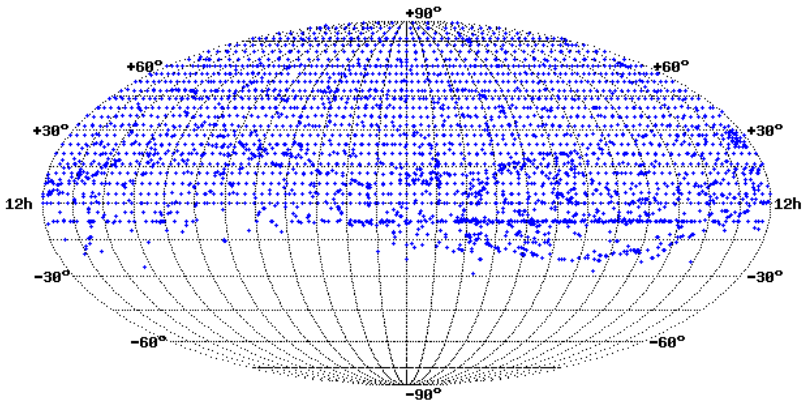


Figure 7: All-sky distribution of the GUA040C plate centers.

At the moment the plate digitization of the Ukrainian plate catalogues is just started: for the plates of the Main Astronomical Observatory with the flatbed scanner MICROTEK ScanMaker 9800 XL and Transparent Media Adapter-1600 with resolution 1200 dpi; for the plates of the Nikolaev Observatory with small EPSON flatbed scanner.

Acknowledgements

This work is supported by the bilateral cooperation between the Bulgarian Academy of Sciences and the National Academy of Sciences of Ukraine. The authors thank SOC and LOC for their support.

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