

THE KYIV MERIDIAN AXIAL CIRCLE' OBSERVATIONAL ARCHIVE AS THE UKRVO SCIENTIFIC RESOURCE

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ABSTRACT. We describe the database of CCD-observations conducted with Meridian Axial Circle in 2001-2003. In that time it was equipped with a ISD017AP CCD having 1040x1160 pxs, 16 mkm pixel size and 1.394" per pixel scale which is the component of UkrVO astro-information resource. We developed the software for management and accumulation of these and new data, which will be used to create a catalogue for clarification of coordinates of faint stars. We note that the MAC is a refractor (D=180 mm, F=2.3 m) which is used now in a CCD astrometric survey of the equatorial zone.

Key words: virtual observatory, Meridian Axial Circle, CCD-archive

In 2000, the Kyiv Meridian Axial Circle (MAC) was equipped with a new modern micrometer based on a CCD image sensor (manufactured at the Mykolaiv Astronomical Observatory). Since 2001, after necessary tests of electronics and the matrix quality, the telescope is in operation for observational programs. The photometric system of the MAC reproduces standard V photometric system; the limiting magnitude is about $V=17$. Star pixel coordinates are measured with an accuracy of 0.02 pxs and star fluxes to 0.02 mag. The telescope is used for observations of equatorial stars with the aim of measuring their positions, proper motions, and magnitudes. These observations are performed by a group of astronomers from the Astronomical Observatory of the T. Shevchenko National University of Kyiv and from the Main Astronomical Observatory of the National Academy of Sciences of Ukraine (Babenko et al, 2005).

In 2001-2003 years, a pilot program of observations of stars in 192 fields with extragalactic ICRF sources in the declination zone from 0° up to $+30^\circ$ were performed (Telnyuk-Adamchuk et al., 2002). These observations have formed the basis for compilation of the catalogue KMAC1 of positions, photometric data, and proper motions of 115000 stars (Lazorenko et al., 2005). We created the database of these observations as well as developed the software for information management and accumulation of new data.

In 2009 the Kyiv Meridian Axial Circle was equipped with CCD-camera Apogee Alta U47 with the CCD-matrix e2v CCD47-10. It has the format 1024x1024 pxl with size

of pixels $13 \times 13 \mu\text{m}$, dark signal 0.66e/px/s, and noise of reading of 10 e for $T=-20^\circ\text{C}$. In CCD-camera the 16-digit analog-digital converter (ADC) is used. In comparison with previous camera with 12-digit ADC the new CCD camera allows us to register the more bright stars (mainly, reference Tycho2 stars) without repletion ADC image of star along all the length of CCD-matrix. Thus, the range of stellar magnitude in equatorial zone was succeeded and extended from $11.5^m - 17^m$ up to $8.5^m - 17^m$. Now the conduction of observations with new camera is the main aim of a the long-time observational program of stars in equatorial zone.

Currently the CCD-archive of the MAO NAS of Ukraine contains of about 16,000 CCD scans obtained in 2001-2003 in equatorial zone of the sky. These scans are saved on CD-ROMs, namely the CCD-frames with ICRF radiosources from 192 fields of KMAC1. The total size of archive is about 5.5 Gbyte and contains almost 800,000 images of stars.

Since 2009 this archive is a supplement by new observations. We are working on the creation of the database of the CCD-observations and tools for its administration under the UkrVO program (Vavilova et al., 2012a, 2012b, 2011, 2010).). The Web-interface for data search is realized in the form of package of the scripts in PHP script language, which has the wide library of functions for interaction with MySQL. It represents the HTML-form called from a browser.

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