

STATE AGENCY ON SCIENCE, INNOVATION
AND INFORMATION OF UKRAINE
RESEARCH INSTITUTE “NIKOLAEV ASTRONOMICAL OBSERVATORY”

**ASTRONOMICAL RESEARCH:
FROM NEAR-EARTH SPACE
TO THE GALAXY**

International Conference

ABSTRACT BOOK

September 26-29, 2011,
Mykolaiv, Ukraine

hemisphere sky from -20° to $+85^\circ$. The observations were carried out to solve different scientific tasks using 4 instruments. The archive also contains all catalogs of NAO in the form of digital images and textual files. At the middle of 2011, the volume of accumulated data in the form of CCD images was more than 500 GB, and in form of scanned plate images was more than 600 GB. Archive data is regularly included in several NAO databases with user friendly interfaces. Nikolaev Virtual Observatory (NikVO) was created as the result of work in 2007-2009 on development of these astronomical databases. We have taken an active part in development of the Ukrainian Virtual Observatory (UkrVO) since 2010. Most part of Nikolaev data archive, including all astrometric catalogs and observational data, were integrated into UkrVO website <http://ukr-vo.org>.

USING DIGITIZED PHOTOGRAPHIC OBSERVATIONS FOR THE CREATION OF MODERN ASTROMETRIC CATALOGUES OF COORDINATES AND PROPER MOTIONS

*Yu. Protsyuk¹, S. Protsyuk¹, O. Kovylianska¹,
M. Martynov¹, V. Andruk²*

¹*RI "Nikolaev Astronomical Observatory", Mykolaiv, Ukraine;*

²*Main Astronomical Observatory NASU, Kyiv, Ukraine*

We present a possibility of receiving new astrometric stellar catalogues of coordinates and proper motions with good accuracy by using digitized images of old photoplates scanned with existing consumer and prosumer scanners.

The plates for scanning and image processing were taken from an archive of the RI NAO, which contains more than 8400 plates obtained with the Zonal Astrograph (D=160 mm, F=2.04 m, FOV= $5^\circ \times 5^\circ$). Selected plates obtained from 1972 to 1993 were scanned with two scanners: Epson Perfection V200 Photo (consumer) and Epson Perfection V750 Pro (prosumer); with a resolution power of 1200 DPI. Raw data processing, including image filtration and recovery of bright stars, were made using MIDAS software package. Further reduction and analysis of results were carried out using our own software and the Tycho-2 reference catalogue.

Using both scanners with the same parameters for scanning plates in series of 5 scans, we made data reduction, and received two catalogues of star positions and proper motions in ecliptic zone and

galactic plane. Catalogues contain the coordinates of stars in the ICRS system from 7 to 14 magnitude, main part of them from 11 mag to 13 mag, with the mean epoch of observations about 1977. The sample standard deviation of position measurement is about 0."06 in RA and 0."07 in DEC. Root mean square error of (O-C) differences is about 0."09 for coordinates and 0."005/year for proper motions. Further work in this direction is being successfully continuing.

**COMPILED ASTROMETRIC CATALOGUE
OF 196600 REFERENCE STARS
FOR CCD-OBSERVATIONS
OF 240 EXTRAGALACTIC RADIO SOURCES**

*V. Ryl'kov¹, N. Narizhnaja¹, G. Pinigin²,
N. Maigurova², M. Martynov²*

¹*Pulkovo Observatory, Saint-Petersburg, Russia;*

²*RI "Nikolaev Astronomical Observatory", Mykolaiv, Ukraine*

Compiled Catalogue of Reference Stars up 17^m (Pul-ERS) around Extragalactic Radio Sources is created to obtain the high precision coordinates of 240 Extragalactic Radiosources (ERS). Nine catalogues of stars observed by ground based telescopes and were used for compiling the Pul-ERS catalogue. Among them the photographic observations of the stellar fields were made with Pulkovo Normal astrograph, Zeiss telescope of in Observatory of Kiev University and 26" refractor of in Rumanian National Observatory in Bucharest. The Pul-ERS catalogue containing 208 fields around ERS was observed in Nikolaev observatory at telescope with CCD-camera (AMC). The Carlsberg catalogues CMC-9 and CMC-14 from CAMC in La Palma were also included. The catalogue ERL for stars near 398 ERS was used for the northern ERS. We included the coordinates of stars from the Kharkov catalogue XC1 up to 17^m which, in our opinion, it is most reliable of what obtained by scanning the Shmidts plates. For 70% stars the proper motions from UCAC3 catalogue were used to convert the positions of stars to the common epoch. For the rest of stars the proper motions were taken from the XC1.

The size of fields is 40 arcmin. It is enough to guarantee the high precision reduction of the ERS coordinates in optics to construct astrometric system for connection our system with the space and VLBI