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**5-th Gamow Memorial International Conference  
dedicated to 111-th anniversary of George Gamow**

**ASTROPHYSICS AND COSMOLOGY AFTER GAMOW:  
PROGRESS AND PERSPECTIVES**

and

**15-th Odessa International Astronomical Gamow Conference-School**

**ASTRONOMY AND BEYOND: ASTROPHYSICS,  
COSMOLOGY, COSMOMICROPHYSICS, ASTROPARTICLE  
PHYSICS, RADIOASTRONOMY AND ASTROBIOLOGY**



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**PROGRAM AND ABSTRACTS**

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Odessa, Ukraine

**DETERMINATION OF PROPER MOTIONS OF  
CIRCUMPOLAR STARS BY USING IMAGES  
FROM UKRVO PLATE ARCHIVES**

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UkrVO plate archives contain information obtained at different years and in different observatories for the same regions of the sky. It allows us to carry out their joint processing and to receive new results for interesting objects. To obtain proper motions of stars in circumpolar areas, we selected 35 photographic plates from the RI NAO archive and 161 plates from the archive of the MAO NASU in declination zone of 65° to 90°. The mean first epoch of 35 plates is 1930.3. Total number of plates for the first epoch of observations of circumpolar stars in the RI NAO archive is 196. The mean epoch of 161 plates is 1985.7. Total number of plates obtained in MAO during FON program is 2000. Scanning was carried out by using single scan with a resolution of 1200 dpi in MAO and 6 scans with a resolution of 1200, 1500 or 1600 dpi for different plates in the RI NAO. The raw image processing at both observatories was carried out by using the same procedure and MIDAS/ROMAFOT package to obtain (X, Y) coordinates. Astrometric reduction in the Tycho-2 system was carried out by using different programs to compare their behavior near the pole. A catalogue of 265 thousand stars up to 15<sup>m</sup> was compiled in the RI NAO. A catalogue of 565 thousand stars up to 16.5<sup>m</sup> was compiled in MAO. Standard deviations of positions are  $\sigma_{\alpha} = \pm 0.26''$  and  $\sigma_{\delta} = \pm 0.24''$  for the MAO catalogue, and  $\sigma_{\alpha} = \pm 0.11''$  and  $\sigma_{\delta} = \pm 0.18''$  for the RI NAO catalogue. A comparison of positions for common stars from these catalogues was conducted. Positions of common stars were also compared with several astrometric catalogues. Dependencies of different parameters were obtained for catalogue accuracies. Proper motions were obtained for common stars. The obtained result suggests the advisability of processing of all observations to receive proper motions of stars up to 14-15<sup>m</sup> in the declination zone of 65° to 90°.