

0.07±0.88) ° in position angles for close observation periods.

## ASTEROID POSITIONS BASED ON DIGITIZED OBSERVATIONS OF THE NORTHERN SKY SURVEY PROJECT IN DUSHANBE

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We continued to identify asteroids images and create catalogs of their positions based on digitized photographic observations of previous years.

The Dushanbe part of the Northern Sky Survey (FON project) is represented by about 1570 photographic plates obtained in 1985-1992 on the Zeiss-400 astrograph at the Hissar Astronomical Observatory of the Institute of Astrophysics of the Academy of Sciences of Tajikistan. At present, their digitization and further scan processing continue until the final product is obtained in the form of a catalog of equatorial coordinates and stellar magnitudes for all registered objects on the plates. The equatorial coordinates  $\alpha$ ,  $\delta$  of all objects on the plates were obtained in the Tycho-2 reference system at the epoch of exposure of each plate. Photometry of stars for the plates was carried out on the basis of the principles implemented in the processing the plates of the FON project using photoelectric measurements of stars to construct the characteristic curves of the plates. Photographic B-magnitudes of objects were calibrated to photoelectric standards.

In parallel with solving the main task of the project to create a catalog of stars and galaxies, we analyzed the results of processing the plates in order to search for images of asteroids and comets and create a catalog of their coordinates and values.

In total, about 325 positions of asteroids and comets were obtained with visual magnitudes from 7 to 16.5. All positions of the asteroids were compared with the ephemeris. A preliminary analysis of the O-C differences was performed and their comparison with similar results obtained from the digitized observations of the Kyiv and Kitab parts of the FON project.

## "VANISHING & APPEARING SOURCES DURING A CENTURY OF OBSERVATIONS" (VASCO) PROJECT

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The "Vanishing & Appearing Sources during a Century of Observations" (VASCO) project uses existing survey data to find examples of exceptional/unknown astrophysical transients (see Villarroel et al. 2020). Among the broad set of astrophysical goals related to long-term variability of astrophysical objects, are the goals to look for signatures of extra-terrestrial intelligence, which includes signs of vanishing stars, Dyson spheres and photometric signatures of red lasers. In Villarroel et al. (2020) we presented the results of the first VASCO search where ~100 red transients were found. Possible natural explanations are strong M dwarf flares or optical counterparts or high-redshift supernovae. In this presentation, I update the community on the ongoing analysis of the ~100 transients. I also present the currently launched VASCO citizen science project, that has been developed in a cross-disciplinary collaboration between astronomers, image analysis- and machine learning scientists.

## THE SPECTRAL OBSERVATION ARCHIVE OF THE MAO NAS OF UKRAINE AS A PART OF THE UKRAINIAN VIRTUAL OBSERVATORY

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The overview of the content of an Archive of the spectral observation data obtained at the MAO NAS of Ukraine since 1965 is presented. This archive covers a time period about 20 years and contains of 50,000 spectra of variable stars.

This spectral photographic material (glass astroplates) was obtained mostly by the 70-cm reflector AZT-2 (Kyiv) as well as in addition to the 60-cm Zeiss telescope at Mount Terskol, North Caucasus, Russia and 1-m telescope at Mount Sanglok (Institute of Astrophysics, Tajikistan), equipped with spectrographs UAGS with a set of gratings to obtain dispersions in the range of 29 Å/mm to 167 Å/mm in the range of wavelength 3500 - 6800 Å. There is also data related to the experience of using DSA refractor (Double Short Astrograph) with a pre-objective prism to monitor Nova Cygni 1975 in the initial stage of outburst. Almost all the spectra are calibrated with the 9-step attenuator and a comparison spectra for the wavelength scale.

We discuss observational programs (aims, instruments, results), in frame of which this archive was accumulated, as well as key principles for digitizing spectra and their processing by modern tools of virtual observatory software.