Asteroid spectroscopy with FoReRo2 at BNAO Rozhen — first results

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The Bulgarian National Astronomical Observatory (BNAO) in Rozhen (071 Rozhen), with astrometric observations, has been already involved in the Gaia Follow-Up Network for Solar System Objects since the end of 2011. One of our aims is to develop a coordinated program of asteroid spectroscopy complementary to Gaia's observations. In this paper, the first results of asteroid spectroscopy at BNAO Rozhen are presented.

In order to contribute to the compositional characterization of the main-belt asteroids, we performed low-dispersion asteroid spectroscopy with 2-Channel-Focal-Reducer Rozhen (FoReRo2) on the 2-m Ritchey-Chrétien-Coudé (RCC) telescope at BNAO.

We obtained optical spectra of few MBAs using the 2-m RCC telescope equiped with the CCD VarsArray 1300B camera (pixel size 20 µm or 0.736 arcsec/px) in the spectroscopic mode of FoReRo2 in its red channel [1]. The spectroscopic characteristics are: a low-dispersion grism Bausch & Lomb, working in the parallel beam of FoReRo2, with 300 lines/mm which gives 4.3 Å/px and 200 µm width slit which corresponds to 2.6 arcsec. We determined spectral types of the asteroids [2] by the overall shapes of the spectra between 440 nm and 830 nm. For spectral analysis in our work, we use the public software tool M4AST [3]. It covers aspects related to taxonomy, curve matching with laboratory spectra, space weathering models, and mineralogical diagnosis.

Most of the observed asteroids belong to some families and there are no published spectra. Besides their spectra, for some asteroids, best matches derived from a comparison with laboratory spectra are presented.

We are planning to use a polarimetric mode of FoReRo2 and a Wollaston prism in order for the results to be confirmed by obtaining the degree of linear polarization around asteroid phase angles of 10° — around the minimum of polarization in the phase curve, where the deviation for different taxonomic classes is best resolvable.

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