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CCD PHOTOMETR WITH 5 BAND FOR 235-MM TELESCOPE OF BAKU STATE UNIVERSITY

Abstract

A 5-band CCD photometer was developed for the Advanced VX 9.25" Schmidt-Cassegrain telescope of the Baku State University Student Scientific Technical Creativity Center. The photometer was designed for photometry of celestial bodies in the optical, near ultraviolet and near infrared range. The aperture (diameter) of the telescope is D=235 mm, focal length F=2000 mm. As a light receiver, a CCD matrix with a size of 2048 x 3056 pixels (1 pixel=9 microns) is used. A focal reducer is installed to increase the aperture ratio of the telescope. When placed in the focal plane in front of a camera, a focal reducer leads to a wider field of view and a brighter image of extended objects, which is important for reducing the exposure times when imaging faint extended objects like nebulae or galaxies. The focal reducer can be easily inserted and removed from the optical axis. Therefore, Telescope + CCD the photometer system operates in two optical modes with focal ratios of f/10 and f/6.3. The field of view of the telescope is 32'x47' in the first case, and 50'x75' in the second case. Calculations show that using this system it is possible to carry out photometric observations of celestial bodies with a brightness of up to 15m magnitude at a 300-second exposure with a signal-to-noise ratio S/N=100. Thanks to its large field of view, the telescope can also be used to search for novae and supernovae, asteroids, comets and space debris. Since the telescope is portable, it can be useful for students to conduct scientific research at convenient observation points.