

ASTROMETRIC AND PHOTOMETRIC OBSERVATIONS OF PHAS WITH 70 CM TELESCOPE

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ABSTRACT

A potentially hazardous asteroid (PHA) is a near Earth object (NEO) with an orbit that can make close approaches to the Earth and is large enough to cause significant regional damage in the event of impact. PHAs are defined as having a minimum orbit intersection with Earth of less than 19.5 lunar distance and being brighter than 22nd magnitude. Currently, there are over 2300 objects classified as PHA. None of the PHAs present a threat to the Earth in the near future. However systematic observation of these objects can broaden our understanding of their orbital and physical properties.

The Faculty of Mathematics, Physics and Informatics of Comenius University in Bratislava, Slovakia (FMPI) operates 70 cm Newtonian telescope (AGO70) situated at the Astronomical and Geophysical Observatory in Modra, Slovakia. Telescope was registered with Minor Planet Center database in November 2022 and received designated code M34. AGO70 telescope is fully capable of tracking object with angular velocities up to 1.5deg/s, which enables long exposure observations even of fastest NEOs without trailing. The fastest PHAs have sky motion of up to 100s of degrees per day, which can be problematic for large and slow telescopes.

AGO70 is capable of astrometric and photometric image acquisition of these fast objects. Precise astrometric observations of low brightness objects are used to improve orbital parameters and refine the ephemeris. Photometric light curves of rotating objects contain complex information about object's shape and reflective properties. Shape of the light curve is directly related to the rotational period, and with long term observations and light curves can be used to calculate object's absolute magnitude, size, and slope factor. Telescope is equipped with Johnson-Cousin BVRI and Sloan g,r,i filters and is able to acquired color indices of observed objects.