Astrometry and Spectra Classification of Near Earth Asteroids with Lijiang 2.4m Telescope

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Abstract. The Lijiang 2.4m telescope of Yunnan Observatories is located at longitude E100°01′51″, latitude N26°42′32″ and height 3250m above sea level (IAU code O44). Because of low latitude of the site, long-focus system and planetary tracking mode of telescope, high accuracy positioning and spectral classification of the near Earth objects (NEAs) especially in the Southern Hemisphere can be studied with the Lijiang 2.4m telescope. As a set of observational campaigns organized by the GAIA-FUN-SSO, astrometry of several near Earth asteroids including (367943) Duende and (99942) Apophis were made with Lijiang 2.4m telescope during 2013. From December 12, 2015, spectra of three near earth asteroids were also observed with the YFOSC terminal attached to the Lijiang 2.4m telescope. This paper will give the detailed introduction of Lijiang 2.4m telescope and observational results of near Earth asteroids obtained with it.

Keywords. methods: observational, techniques: astrometry, spectrum classification.

1. Introduction

Knowledge of asteroids and comets, the relic of planet building blocks, directly sheds light on the formation of terrestrial planets, and the origin and evolution of the Solar System. Modern asteroid surveys have greatly enhanced the detectability of small NEAs and distant comets. In the past two decades, the number of known NEAs and comets has increased drastically. Given that the observable windows of newly detected objects are often quite narrow (merely a few days), prompt follow-up observations are critical for orbit determinations as well as for the interpretations of the physical properties.

Lijiang 2.4m telescope (Figure 1) is equipped with the Yunnan Faint Object Spectrograph and Camera (YFOSC), which is capable of conducting optical imaging and low-resolution spectroscopy from 300 to 1000 nm, the parameters of grisms often used are given in table 1. Aided with the planetary tracking mode, Lijiang 2.4m telescope is an ideal facility to carry out follow-up physical studies on newly discovered NEAs.

2. Astrometry

As parts of pre-launch training programs organized by the Gaia-FUN-SSO, several NEAs such as (99942) Apophis, (367943) Duende and 2013 TV135, were observed with the Lijiang 2.4m telescope (Zhang et al., 2015; Wang et al., 2015; Thuillot et al., 2015).

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3. Optical Spectrum Classification

In table 2, we present the detailed observational information of five NEAs with the Lijiang 2.4m telescope during 2015-16, and their taxonomic types according to the feature-based Bus-taxonomy (Bus et al., 2002) will be given in our follow-up work.

4. Acknowledgments

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References