PHYSICAL INVESTIGATIONS OF THE FLORA FAMILY ASTEROIDS.

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Introduction

Recent studies have shown evidence that statistical properties of asteroids' physical parameters are the fundamental source of information on the physics of their collisions and evolution. There are probably several different mechanisms shaping the distribution of spin rates and spin vector orientations of small MBAs and NEAs, leading us to expect that the distributions may be non-Maxwellian, and possibly even bi-modal. Also, due to the YORP effect we may expect a correlation between spin rates and pole orientations [1,2]. However, these effects are presumably dominant for small bodies, while the present dataset contains, at least for MBAs, mainly large or medium-sized bodies. Further spin vector data are urgently needed, especially for NEAs and small and family MBAs [3]. In this context the Yarkovsky/YORP effects may play fundamental role [4,5].

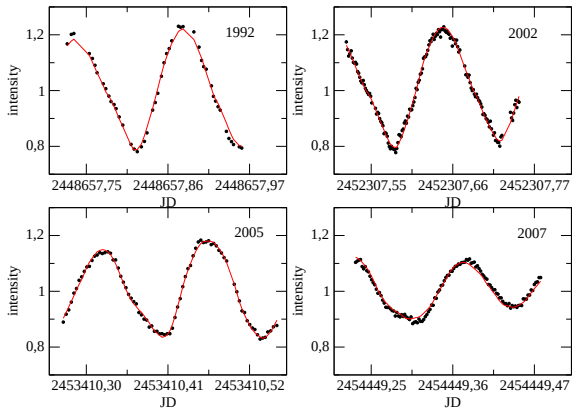

Figure 1: Observed (dots) and modelled (lines) lightcurves for Tanina from four different oppositions, observations from 1992 comes from [9].

Observations and results

Several years ago we started studies of the interrelations among Flora family asteroids. This family has a lot of members and is dynamically dispersed in eccentricity and inclination. Its location in the inner main belt makes their members available for photometric and spectroscopic observations even for small telescopes. According to [6], this region of the main belt is now detected as Baptistina family plus a lot of small clumps. Untitl now we have observed lightcurves of 65 asteroids from this family at Borowiec, Pic du Midi, Kharkov, NAO Rozhen and other observatories. For the first objects we are able/we will be able in the near future to determine their physical properties using lightcurve inversion method developed by Kaasalainen et al. [7,8]. Note that this method in practice requires about 15-20 lightcurves obtained at 5-6 oppositions for each asteroid. Having lightcurves like for 825 Tanina (Fig 1.) we were able to determine its spin vector as $\lambda = 26^\circ$ $\beta = 52^\circ$, sidereal period of 0.2891587^d and shape. Unfortunately, for many objects the dataset is still insufficient, however we are able to determine their synodical periods of rotation. Our lightcurves as well as those already published allow to make good statistical distribution. To complete our studies we have started spectroscopic observations of the members of the Flora family using the 105 cm telescope at Pic du Midi and the low resolution SBIG SGS spectrograph with ST8 CCD camera. This system is called now PICASSO (**Pic** du Midi **A**steroids **S**pectroscopic **S**urvey **O**bservatory). First results of our investigations will be presented.

References

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