

Radiation forces and torques can, on a long term, modify translational and rotational motion of small asteroids and meteoroids. In this thesis I focus on the radiation torques dubbed the Yarkovsky-O'Keefe-Radzievskii-Paddack (YORP) effect. In particular, my principal goal was to analyse available photometric database of small asteroids and suggest candidate objects for which the YORP effect could be directly detected during the next few years. The structure of the thesis is as follows: (i) in the Introduction I discuss general role of radiation forces and torques in the motion of small bodies in the Solar system, (ii) next, in Section 2, I introduce observation methods for determination of the rotation state of asteroids and the way how YORP may exhibit itself in such measurements, and (iii) finally, in Section 3, I present few candidates for the YORP effect detection. Based on this selection procedure, I obtained lightcurves of a small near-Earth asteroid (3554) Amun from February till April 2011. These observations were performed using the 65cm telescope of the Astronomical Institute of Charles University located at Ondrejov observatory. Together with available data from Amun's 2009 and 2010 oppositions, the 2011 photometry should serve for shape and pole reconstruction of this body. The YORP effect could be then detected as a phase shift in its 1987 observations.