

The Yarkovsky effect on the asteroid with inhomogeneous surface albedo revised

Md. Abu Saklayen[1], Tadashi Mukai[2]

[1] Science and Technology, Kobe Univ, [2] Space and Planetary Materials, Kobe Univ

It is known that the Yarkovsky effect, caused by reaction force due to the absorbed and reemitted radiation from the non-isothermal surface of rotating body, plays a role even for asteroids to affect their orbital evolution during a long time, e.g. 10^6 years. Since the temperature pattern on the surface of asteroid, i.e. a directional distribution of absorbed and reemitted radiation, strongly depend on the surface structure, as well as a shape of asteroid. Our photo-polarimetric observations of asteroids revealed that the surface albedo of asteroid varies with a rotation of asteroid. This suggests that the net Yarkovsky force is not constant over the rotation period of asteroid due to the temperature pattern caused by the inhomogeneous albedo distribution on its surface. In the previous works to examine the Yarkovsky effect, the asteroid is assumed as a sphere with the uniform surface albedo. In this work, we try to evaluate the Yarkovsky force on the asteroid, taking into account the albedo distribution on its surface, and study its effect on the orbital evolution of asteroid.