## Decelerating spin state of 25143 Itokawa due to YORP effect

Kohei Kitazato (University of Tokyo), Abe Masanao (Japan Aerospace Exploration Agency), Masateru Ishiguro (Seoul National University)

Abstract: The Hayabusa mission revealed fundamental physical properties of the small near-Earth asteroid 25143 Itokawa, such as shape and mass, during its rendezvous with the asteroid in 2005. Resulting from this, the YORP-induced change in asteroid's spin state has been predicted theoretically. We present the results of ground-based photometric observations of the asteroid Itokawa from March 2001 to December 2006 and of numerical modeling of its lightcurves using the detailed shape model and global surface photometric properties derived from the Hayabusa mission. As a non-linear time evolution of rotational phase lag is shown, we found that Itokawa has been decreasing its spin rate. The detected deceleration rate is almost consistent with, but slightly smaller than, the theoretically predicted value due to YORP effect.