

# Photometric property of near-Earth-asteroid (65803) 1996 GT dependent on solar phase angle

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Asteroid of (65803) 1996 GT is an near-Earth-asteroid designed as belonging to the PHA (Potentially Hazardous Asteroid) group ( $q = 1.013$  AU,  $a = 1.644$  AU,  $i = 3.4$  deg. (MPO 53573)) and one of the most accessible asteroids by spacecraft. The object was predicted from ephemeris to make a close pass by the Earth on November to December 2003, which represented the enhancement of the apparent brightness. We had observed the object using Kiso 30-cm Telescope (K.3T) at Nov. 13 to Dec. 4 2003 for long period photometric observation. During this observed time the solar phase angle of 1996 GT had varied 40.0 to 2.0 degrees. K.3T is a robotic telescope newly established at Kiso observatory to observe the objects such as variable stars and targets of opportunity. In addition, we had observed the object 1996 GT using 1.05-m Kiso Schmidt Telescope with UBVRI band filters at Dec. 1 to 4 2003.

From our lightcurve observation, the object has been revealed a binary asteroid to have a satellite, although other observational team independently revealed the existence of a satellite. Moreover, the spectrum of the object at the wavelength from ultraviolet to near-infrared represented that the object is a X-class asteroid among S-, X-, C-classes. X-class is the group composed of E-, M-, P-types asteroids that could not be separated by the spectra. Then we estimated the parameters that describe the surface physical property using the relation between the solar phase angle and the brightness variation, and the results indicated that the object would be a M-type asteroid.

M-type asteroid is considered as an object composed of Fe-Ni metal, and may include the important information about, for example, the core-mantle separation on the solar system formation. The dynamical property of the satellite of the object will include the information about the orbital evolution on the binary system of this object. Thus, 1996 GT asteroid have highly importance for a target of next asteroidal exploratory mission.