PHOTOMETRY AND POLARIMETRY OF LARGEST NEA 1036 GANYMED. F. P. Velichko[1], V. A. Psarev[1], N. N. Kiselev[2], S. V. Zaitsev[2], S. F. Velichko[3,4], and R. Yu. Krymsaljuk[1], [1]Institute of Astronomy of Kharkiv Karazin National University, 35 Sums'ka str., Kharkiv 61022, Ukraine, [2]Main Astronomical Observatory NAS of Ukraine, 27 Zabolotnogo str., Kyiv 03680, Ukraine, [3]International Center for Astronomical, Medical and Ecological Research, 27 Zabolotnogo str., Kyiv 03680, Ukraine, [4]Terscol Branch of Institute of Astronomy RAS, 48 Pyatnitskaya str., Moscow 119017, Russia. fvelichko@ukr.net

Introduction: Asteroid 1036 Ganymed is the largest NEA, belongs to the Amor group, and is classified as S taxonomic type [1] with albedo 0.29 and equivalent diameter about of 32 km [2]. According to results of the observations obtained during its previous approaches to Earth, it was found that asteroid has the rotation period about of $10^h.31$ [3], lightcurve amplitude range $0^m.1$-$0^m.4$ [4], and a complicated shape [5]. The asteroid shows variations of linear polarization and color over the surface [4,6,7].

Observations: Our observations were carried out with the 0.7-m and the 1-m reflectors of Institute of Astronomy of Kharkiv University and Crimean Astrophysical Observatory (Simeiz), respectively. We had used CCD camera ML 47-10 equipped by standard BVRI filters, and a single channel photoelectric polarimeter with V filter. The measurements of the asteroid brightness and polarization were obtained during May-June and August-December 2011.

The observations of Ganymed were made at phase angle α ranging from 1°.3 to 52°.6, that has provided with us a possibility to obtain magnitude-phase dependence of brightness and phase dependence of linear polarization as well as lightcurve at different aspects of the asteroid.

Results: Lightcurves which have been obtained during two runs May-June and August-September 2011 are very different. Firstly, amplitudes of brightness variation equal to $0^m.25$ (α=36°.5) [7] and $0^m.37$ (α=51°.6, Fig.1), respectively.

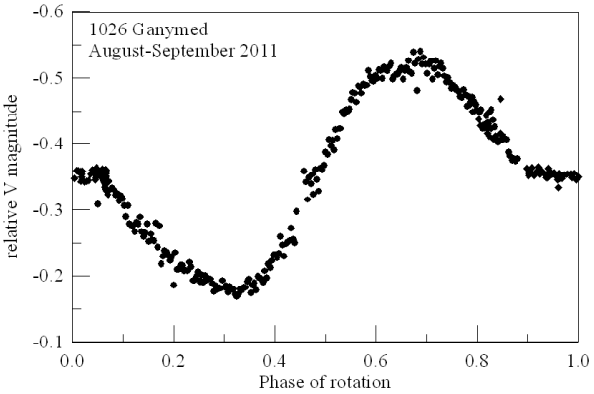

Fig.1. Composite lightcurve of 1036 Ganymed.

Secondly, if the May-June lightcurve shows two maxima and minima per rotation cycle, that lightcurve on August-September shows one minimum and maximum, and long-time plateau of constant brightness from 0.9 to 0.05 phase of rotation (see Fig.1).

At lightcurve primary maximum the obtained color indices are close to earlier observed ones. Only V-R differs on $0^m.05$ between the present opposition and 1985 [4]. The asteroid is redder in color V-R under our observations than under mentioned above.

Fig.2 shows the phase dependence of linear polarization, which is formed of [6,8] and our points. It is interesting to note that the polarimetric slope, obtained from our data, has trend to be a little less than obtained in [8], and that polarimetric albedo of the asteroid is to be larger and closer to IRAS one [2].

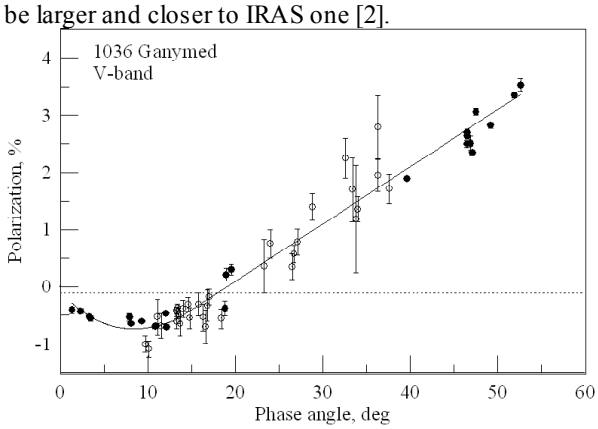

Fig.2. Phase dependence of linear polarization of 1036 Ganymed. Filled symbol – our measurements, opened symbol – data from [6,8].

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