

OBSERVATIONS OF GEO-OBJECTS IN ODESSA ASTRONOMICAL OBSERVATORY

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ABSTRACT

The Odessa Astronomical Observatory (OAO) have begun the astrometry and photometry observations of the GEO objects. For astrometry observations is temporarily used 0.3 m Ritchey-Chrétien. The 0.5 m Cassegrain telescope was used for photometry observations. The observations of GEO-objects were renewed since 2002 year under international campaign in support of radar experiments with Evpatoria RT-70 (Molotov I. E., et al, 2003). Mayaki station of Odessa astronomical observation is located in 40 km from Odessa city near Black Sea.

The station coordinates are: 46 N latitude, 31 E longitude, 15 m on sea level, 125° of geostationary ring are visible from Mayaki.

1. AT PRESENT

Currently there are two operating telescopes. The first telescope is used for positional observations - 0.3 m Ritchey-Chrétien with 0.5° field-of-view (FOV). It equipped with TV tube superizokon LI-804 (S/N threshold ~ 5.0). The detection threshold: 14.^m5 per 0.04 s integration time, and 15^m5 per 0.16 s integration time.



Figure 1. In centre pipe 0.6 m Ritchey-Chrétien telescope, on edge two pipes 30-cm to Ritchey-Chrétien on stations Mayaki.

The second telescope is used for photometrical observations: 0.5 m Kassegrain is equipped with B,V,R filters and electrophotometer with receiver of the radiation FEU-79 with detection threshold ~ 13.^m5. For example on figure 2, 3 shown the sample for GEO-object 1995-099A of photometry light curves got on stations Mayaki during the international radar experiments and radar curves obtained using Evpatoria RT-70=>Bear Lakes RT-64 bi-static system (Konovalenko A., et al. 2003). Searching for of the period was conducted by means of software package, including Fourier-analysis.

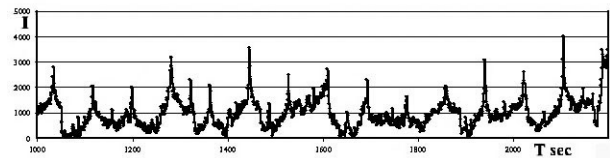


Figure 2. The fragment of photometric light curve in integral spectrum is received 21.06.2004 for GEO object 1995-099A. Time of the accumulation of the signal is 1 sec. Period change of the brightness: $P = 32.61$ sec. On axis Y - an intensity of the signal, on axis H - time

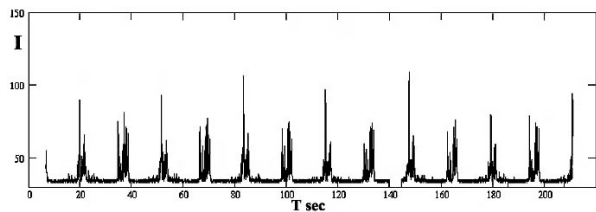


Figure 3. Radar curves obtained using Evpatoria RT-70 => Bear Lakes RT-64 bi-static system is received 03.10.20004 for GEO object 1995-099A. Time to sampling radio signal - 0.016 sec. Period change of the power: $P = 31.85$ sec. On axis Y - an intensity of the signal, on axis H - time

Small difference is at period possible to explain so, light curves there is integrated signal from the whole surface, but radar curves from separate details of the object and different time of the accumulation. The photometry of GEO objects allows by the methods of astrophysics to classify the objects also on character of the motion of the center of the masses, that gives important information, relating to status object, and, accordingly, the danger of approach with actively functioning objects.

2. FUTURE PROSPECTS

The nearest plans are to end modernization (May-June 2005) of the 0.6 m Ritchey-Chrétien telescopes (FOV $\sim 1^\circ$, detection threshold $\sim 17^m$) and to finish the producing the 0.8 m Ritchey-Chrétien telescope. All telescopes are produced in Odessa astronomical observation. The both astrometry and photometry observations of GEO-objects are carried out in accordance with the ephemerides received from Pulkovo observatory.

The current precision of astrometry is $2''$ (Sukhov P. P., et al. 2003), and photometry is $0.^m02$. The future works of Myaki under Pulkovo optical observers cooperation (PulCOO) and national Ukrainian Surveillance System are explained. The PulCOO will purchase FLI IMG1001E 1024 \times 1024 pcs. of 24 mcm for the 60-cm telescope. The Odessa astronomical observation is continuing work on observation and preparing of GEO-object catalogue. We invite interested organizations to cooperate.

3. REFERENCES

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