

Results of GEO and GEO-like space debris studies in 2005

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During 2005 optical facilities of Russian scientific optical network jointly with Astronomical Institute of the University of Bern have made observations aimed at discovering and tracking unknown GEO and recently found so called GEO-like objects, determining their orbits, estimating orbit evolution taking into account all essential perturbation effects, studying possible origin of these objects and their distribution in space by various parameters.

To date, a long series of observations have been obtained for several dozens of objects. A lot more object have been tracking only on relatively short time intervals. For all observed objects estimates of orbital parameters as well as area-to-mass ratio have been made using numerical propagator developed by KIAM and KIAS. Estimation of area-to-mass ratio (AMR) is based on estimation of solar pressure coefficient. This analysis has proved the existence in GEO region of theoretically predicted GEO-like objects with an area-to-mass ratio up to 25 sq.m/kg having due to this extremely strong evolution of orbital parameters different of other objects in GEO region. The paper presents a detailed description of obtained results, analysis of spatial distribution and AMR ratio distribution for observed objects, along with orbital parameters and their accuracy estimation.