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ANALYSIS OF TEMPORAL EVOLUTION OF DEBRIS OBJECTS' ROTATION RATES INSIDE AIUB
LIGHT CURVE DATABASE

Abstract

The Astronomical Institute of the University of Bern (AIUB) maintains a light curve database of debris objects in various orbital regions. Currently the database contains more than 3,000 light curves from more than 500 objects. All the light curves were obtained using the 1-meter telescope ZIMLAT which is located at Zimmerwald Observatory in Switzerland through non-resolving optical observations. The database also contains apparent rotation periods and phase diagrams for most of the objects. Some of the objects in the database also have SLR measurements which were also performed with the ZIMLAT telescope. These measurements can be utilized to determine the attitude and attitude motion of debris targets. In this paper we discuss our analysis of the temporal evolution of the rotation rates and of the signatures in the light curves for different types of objects and orbital regions in the database. Some results obtained from the SLR data will also be discussed. The information resulted from the analysis could be useful for the future active debris removal missions and to understand the intricate relationship between natural forces and satellites attitude in space.