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SPACE DEBRIS SYMPOSIUM (A6)
Measurements (1)

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PHOTOMETRIC CHARACTERIZATION OF GEO OBJECTS FROM THE LOIANO TELESCOPE

Abstract

This report presents the results of several BVRI photometric observations of objects at geosynchronous Earth orbit (GEO) in the US Space Surveillance Network (SSN) catalog. These observations were performed using the 152cm G.D. Cassini Telescope in Loiano, operated by the INAF Astronomical Observatory of Bologna, Italy. The Ritchey - Chretien optical system is equipped with BFOSC (Bologna Faint Object Spectrograph and Camera), a multipurpose instrument for imaging and spectroscopy, with an EEV CCD (1340x1300px). The observations were carried out in May and December 2013. The purpose is to assess the capability of the photometry to give information on the surface characteristics and attitudes of the targets. Moreover a number of photometric standard star fields were observed for calibration purposes. Several targets from the SSN catalog have been observed:

- 1 piece of debris from Ekran: SSN 29014
- 1 piece of debris from LES 8: SSN 13753
- 5 SL-12 rocket bodies: SSN 38104, 17125, 20926, 17705, and 27444
- 2 IUS rocket bodies: SSN 19913, 21641
- 1 operational GEO satellite: SSN 34810
- 3 non-operational GEO satellites: SSN 27912, 28912, 28912, 02653

Furthermore long exposure, sidereally tracked images of these objects with no filter have been taken where the object appears as a trail. These have been analyzed to produce light curves and detect the primary frequencies of the object's brightness variation. The paper presents the obtained data and the discussion on how to establish the surface characteristics of these targets from BVRI photometry.