

14TH IAA SYMPOSIUM ON SPACE DEBRIS (A6)
Measurements (1)

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ANALYSIS OF THE BRIGHTNESS VARIABILITY OF GEO OBJECTS

Abstract

In order to study the short-term brightness variability of uncontrolled objects at geosynchronous Earth orbit (GEO), observations are obtained while the telescope is tracking at the sidereal rate, and the GEO object is trailed across the field of view (FOV). Analysis of intensity changes along the trail reveals the primary frequencies of the object's brightness variations on time scales of a second or less. These observations were performed using two telescopes:

- The University of Michigan's 0.6m Curtis-Schmidt telescope located at the Cerro Tololo Inter-American Observatory (Chile) equipped with a thinned, backside illuminated CCD with 1.45 arc-seconds/pixel and a FOV of 1.6x1.6 deg.
- The 1.5m Cassini telescope in Loiano (Italy), operated by the INAF (National Institute for Astrophysics) Astronomical Observatory of Bologna, equipped with BFOSC (Bologna Faint Object Spectrograph and Camera), a multipurpose instrument for imaging and spectroscopy, with 0.58 arc-seconds/pixel and a FOV of 13x 12.6 arc-min.

Exposures of the same star field both before and after the GEO object crosses the FOV have been acquired to remove contamination by stars of the GEO trails. Photometric standard star fields were observed for absolute calibration purposes. This paper describes the results of the detection of primary frequencies of brightness changes of a sample of uncontrolled GEO objects.