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Space Debris Detection, Tracking and Characterization (1)

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DISCOVERY AND CHARACTERIZATION OF FAINT SPACE DERBIS BY NEW 50 CM TELESCOPE IN CHILE

Abstract

New telescope with 50 cm aperture has been installed in Chile in May 2017 by Astronomical Scientific Center, JSC. During 10 months of operation (May 2017 – Feb 2018) this instrument has been used to perform dedicated observations aimed at search, follow-up and characterization of primarily faint space debris objects in GEO over the Western hemisphere, GTO and other HEO and MEO orbits. The instrument is capable to perform automated association of obtained measurements with orbits of known objects and initiate a follow-up mode for any supposedly new object. 10 months of operation resulted in observation of 453 new and recovery of 232 previously discovered but then lost high orbit space debris having standard magnitude down to 19.1. For 127 of new and 140 of recovered objects the instrument has fully autonomously collected sufficient amount of measurements at several nights to determine reliable orbit, estimate area-to-mass ratio and brightness mean values and variations. Other new and recovered objects have been followed-up at initial stage also by ISON and ASPOS OKP telescopes. This paper will provide detailed information on estimated orbital and physical characteristics of observed objects. First results of study of population of space debris at near 63.4 deg inclination HEO orbits with apogee over the Southern hemisphere will be presented.