

SPACE DEBRIS SYMPOSIUM (A6)
Measurements and Space Surveillance (1)

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OPTICAL SURVEYS FOR SPACE DEBRIS IN MEO – SIMULATIONS AND FIRST RESULTS

Abstract

During the last decades considerable effort has been spent to measure the space debris environment in different orbital regimes using radar and optical sensors. Most surveys concentrated either on the densely populated low Earth orbit altitudes (LEO) or on the unique region of the geostationary ring (GEO). Some limited results from surveys of the geostationary transfer region (GTO) are available, as well. The increasingly populated space used by the global navigation satellite constellations like GPS, GLONASS, Beidou-2/COMPASS, and GALILEO has not been systematically investigated so far. Compared to the GEO/GTO surveys, MEO survey strategies have to cover much larger ranges of angular velocities and orbit inclinations. Furthermore, due to the large volume occupied by these constellations the apparent surface density of objects in the survey space is expected to be low and therefore the generation of statistically relevant results requires a large area to be surveyed. The paper will present performance and population coverage evaluations for different MEO survey strategies and for two sensors - the ZimSMART wide field telescope located at the Zimmerwald observatory in Switzerland, and the ESA space debris telescope having a narrow field of view. The simulation result will be complemented by data from real surveys.