

SPACE DEBRIS SYMPOSIUM (A6)
Operations in Space Debris Environment, Situational Awareness (7)

Author: Dr. Alessandro Vananti

Astronomical Institute University of Bern (AIUB), Switzerland, alessandro.vananti@aiub.unibe.ch

Prof. Thomas Schildknecht

Astronomical Institute University of Bern (AIUB), Switzerland, thomas.schildknecht@aiub.unibe.ch

Mr. Gian Maria Pinna

ESA/ESAC, Spain, gianmaria.pinna@esa.int

Dr. Tim Flohrer

European Space Agency (ESA), Germany, tim.flohrer@esa.int

ASSESSMENT OF POSSIBLE OBSERVATION STRATEGY IN LEO REGIME

Abstract

The European Space Agency (ESA) is developing an independent system for Space Situational Awareness (SSA). One component of the draft architecture of the system foresees a network of optical telescopes for observations in the GEO/MEO/LEO regions. The telescope network will survey and track objects up to a certain limiting magnitude and will allow the collection of accurate orbits. Major design drivers are the requirements on coverage of the existing object population, timeliness for detecting particular events, such as, e.g., fragmentations, releases, or orbit maneuvers, and orbit accuracy for cataloguing. In this work, a possible strategy for covering the upper LEO regime by optical observations is analyzed. The visibility limitations of LEO objects observed from stations at different latitudes are evaluated. Coverage simulations of the existing LEO population are performed considering different numbers of sites. Using simulated LEO observations of selected test objects, the orbit determination accuracy depending on different observation intervals is examined.