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Two-color and multistatic space debris laser tracking

Collisions with Space Debris in orbit are a growing threat to operational satellites and manned space missions. Optical observations, providing direction information and radar tracking providing range are established methods for maintaining a valid catalog of space debris items and their orbits. From this catalog one can obtain the probability of collisions and appropriate maneuvers can be scheduled. In an ideal scenario SLR can provide both, range information and pointing angles at the same time, thus speeding up the orbit determination process of space debris targets as well as providing a better forecast of the respective orbit. In order to investigate the potential of the SLR technique the ESA GSTP project "Accurate Orbit Determination with Laser Tracking/Tasking" was started in 2013. We report on the technical progress achieved over the last year by introducing improved visual tracking, IR ranging on the fundamental frequency of Nd:YAG and a new tracking site in Stuttgart. Furthermore it was possible to intensify the multi-static ranging including Graz, Wetzell and Stuttgart. These results are also presented.