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ESA activities on satellite laser ranging to non-cooperative objects

Satellite laser ranging (SLR) to non-cooperative objects is an emerging technology that can contribute significantly to operational, modelling and mitigation needs set by the space debris population. ESA is conducting various research and development activities in SLR to non-cooperative objects. ESA's Space Situational Awareness (SSA) program supports specific activities in the Space Surveillance and Tracking (SST) segment. Research and development activities with operational aspects are run by ESA's Space Debris Office. In our presentation we will outline the motivation and objectives, as well as detail the current status of the various and parallel SLR-related SST and Space Debris Office activities at ESA. We will provide an overview on plans for SLR activities in research and development, and for operational support. Current gaps in the standardisation of data exchange and sensor interfaces will be addressed, reflecting the need of coordinating multiple stations in all tasks. This task is proposed to be provided through an expert centre, coordinating the contribution of SST system-external loosely connected SLR sensors, and providing back calibration and expert evaluation support to the sensors. Operational support to ESA and third party missions is provided by the Space Debris Office. Currently, the office studies the potential benefits of laser ranging to resolve close approaches, to improve re-entry predictions, and during contingency situations, as well as the determination of attitude and attitude motion from a combination of radar imaging, optical and laser data.