Validation & Qualification of Space Debris Laser Systems at the Expert Centre for Space Safety

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To pave the way towards a sustainable use of the outer space, the Expert Centre for Space Safety (ExpCen) coordinates data acquisition and exchange for passive and active sensors operating in different spectral regions, and configurations, aiming at diverse target objects. Within the optical regime, ongoing efforts address the validation and qualification (V&Q) of passive optical and space debris laser ranging sensors, which is an integral service that comprises the interfacing and tasking of the candidate sensor, in addition to retrieving and post-processing the acquired observations to ensure the compliance with predefined quality metrics. The candidate sensor will be certified for participating in future campaigns, after successful completion of V&Q, besides being provided with technical support and system related feedback to successfully complete the V&Q.

Regarding active optical systems, the ExpCen has does not only profit from the profound legacy from the Satellite Laser Ranging (SLR) community, but the outcome of different activities conducted within the development and establishment of the ExpCen.

In this presentation, we will describe the architecture of the ExpCen laser ranging processing engine, including algorithms, new in-house developments and future improvements. Furthermore, after the compilation of results and lessons learnt from past activities, we redefine the requirements for validation and qualification of candidate sensors. We present examples of observations including sensors operating in monostatic and bistatic configurations.