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SESSION   Session 4: Automation and autonomous station operations

TYPE   Presentation

ABSTRACT

German Aerospace Center develops and tests novel technologies for both traditional SLR and space debris laser ranging. Currently, it operates an engineering SLR station at Stuttgart Uhlandshöhe with a fibre-based transmitter. Research is focused on high repetition ranging (> 10 kHz) and the use of infrared lasers. Furthermore, a new container-based station called STARC has been set up near Stuttgart. It contains a coudé path and is developed mainly for space debris laser ranging.

To reduce the overhead, both stations are operated by the same software, called OOOS (orbital objects observation software). It is designed with the goal of utmost flexibility to be used in many different scenarios. A three layer system with loose coupling between different modules ensures that any part of the software can easily be replaced with a new module if the need arises. The modules can be implemented in different programming languages, and run on different PCs in the same local network. Only the lowest level contains hardware-specific code, and new hardware can be included easily by adding one single third-layer module.

The software is designed for a high degree of automatization, which will be implemented step by step and tested on various hardware systems. The long term goal is a robotic and partly autonomous operation of both SLR stations.