

# Expert Centre for supporting Satellite Laser Ranging observations



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To discover new space debris objects and to determine and maintain their orbits, optical, radar, and Satellite Laser Ranging (SLR) observations are used. Using SLR measurements for improving orbits of defunct satellites are being explored to support satellite operations. Expert Centre provides expert support to determine the readiness of a certain sensor in terms of space debris observation capability following qualification procedures.

## Operational Functions

- Coordinate the sensors for tracking and surveillance tasks
- Qualify external data sources
- Service Level Agreement

## Optical & SLR Expert Centre

- Efficiently task several external optical sensors and SLR Stations.
- Combines expertise in the field of observation techniques (optical passive and SLR) and maintains an overview on the sensors availabilities and capabilities
- Support standardisation

## Support Functions

- Calibration of sensors
- Evaluation of observation and processing techniques
- Data quality control

Experts Support and R&D

Quality Working Group

ILRS Debris Study Group

ILRS Community

External (SLR) Sensors

Tasking

Observation data

General status

Coordination of SLR Sensors

Data for Qualification

Qualification analysis of data: SLR and optical

Calibrated data

General status of External Sensors

Data & Tasking Centre

Internal Sensors

Planning

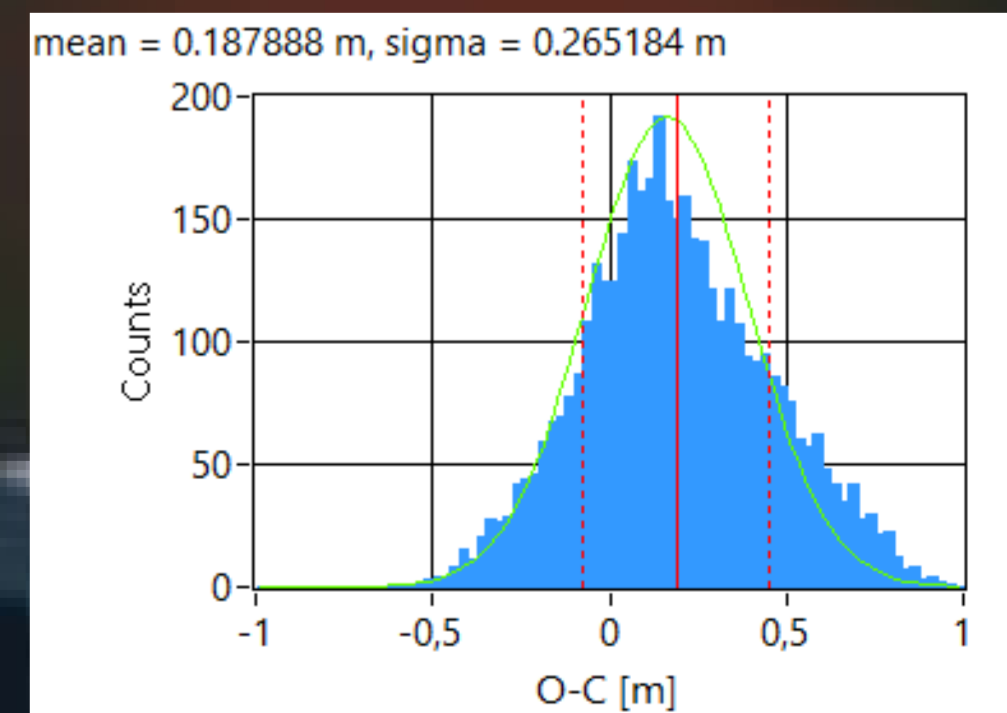
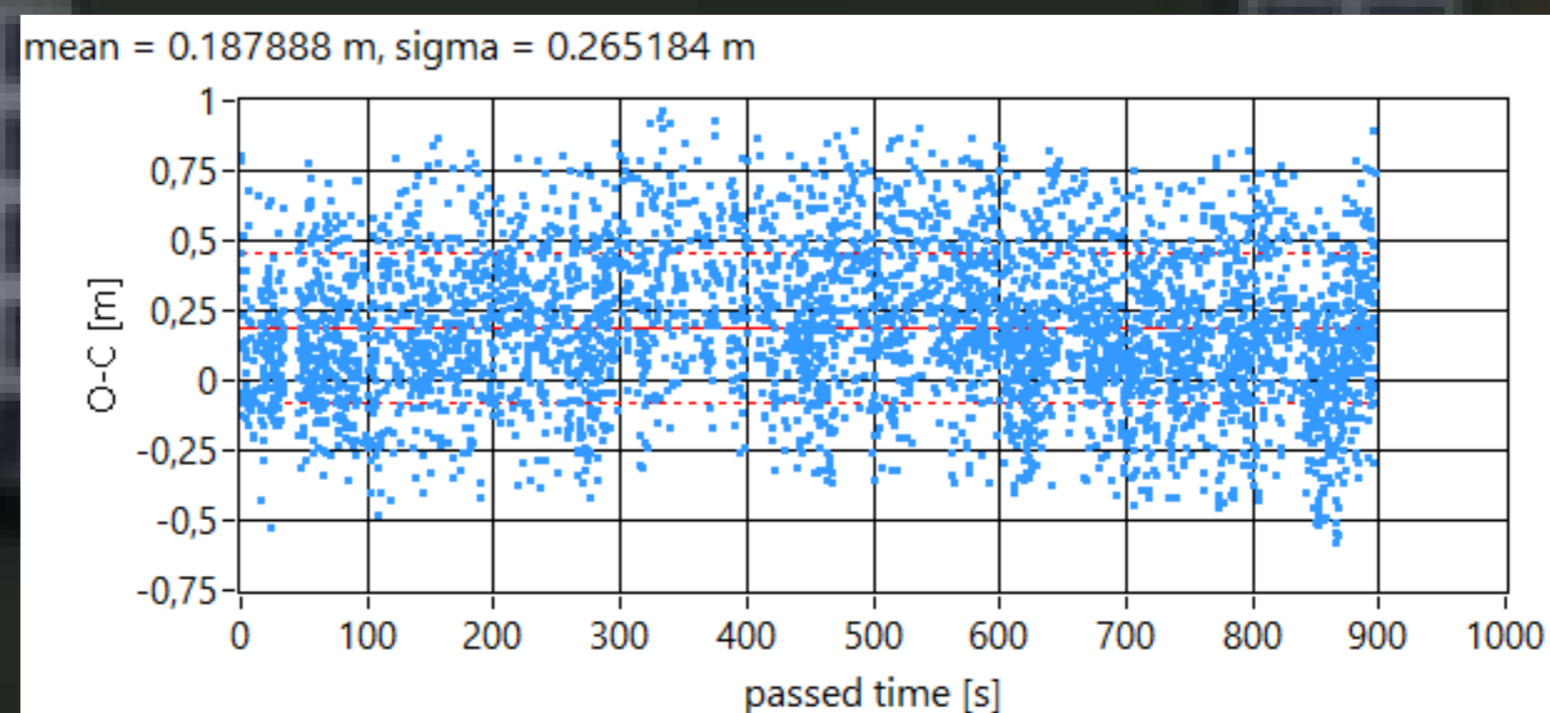
Sensor IF

Data Processing

Services Provision

## 1<sup>st</sup> Results from Borowiec SLR station validated and qualified by Expert Centre:

Target	Date	Pass #	Mean [m] (full rate data)	Standard deviation [m] (full rate data)
Lageos-1	2016/11/21	1	0.19	0.27
Lageos-1	2016/11/28	2	0.22	0.31
Lageos-1	2016/11/28	3	0.12	0.31
Lageos-2	2016/11/09	1	-0.18	0.28
Lageos-2	2016/11/28	2	0.32	0.31
Lageos-2	2016/11/28	3	0.21	0.33



ESA is interested in SLR to (uncooperative) objects. Present and future work regarding Expert Centre includes support to technology development beyond the SSA needs, such as support for determination of attitude and attitude motion, can be supported through the Expert Centre

