DWIH SYMPOSIUM "SUSTAINABLE SPACE"

DLR - INSTITUTE OF TECHNICAL PHYSICS

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Innovative laser optical ground station technology





SPACE SAFETY AND SUSTAINABILITY

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Satellite laser ranging (SLR): Mature and operational technology



- International Laser Ranging Service (ILRS): Global laser optical ground station network of more than 40 active stations for geodetic / geophysical applications, 12 stations are planned to be set-up
- Extremely high laser ranging precision (few mm) of orbits of cooperative objects (equipped with retroreflectors)

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miniSLR: compact SLR ground station

- Highly accurate distance measurement to satellites in orbit (LEO and MEO)
- Fully automated and sealed system
- Satellite laser ranging demonstrated with precision on cm level
- Orbital payload component (retroreflectors) adapted to miniSLR ground station
- SLR as a contribution for a sustainable use of densely populated orbits



SLR: Satellite laser ranging

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Compact staring sensor technology

- Monitoring of new, uncatalogued orbital objects
- Size detection sensitivity: 1 m² sized objects in LEO
- Fully automated operation in weatherproof housing for operation at remote sites
- Transportable and compact size



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High-end laser optical ground stations

- Johannes Kepler Observatory: Largest reflector telescope (within EU) for monitoring of orbital objects
- Telescope aperture: 1.75 m
- Light curve analysis and attitude assessment for preparation of satellite service missions
- Surveillance, Tracking, and Ranging Container (STAR-C): Robust laser optical ground station for space debris monitoring



