

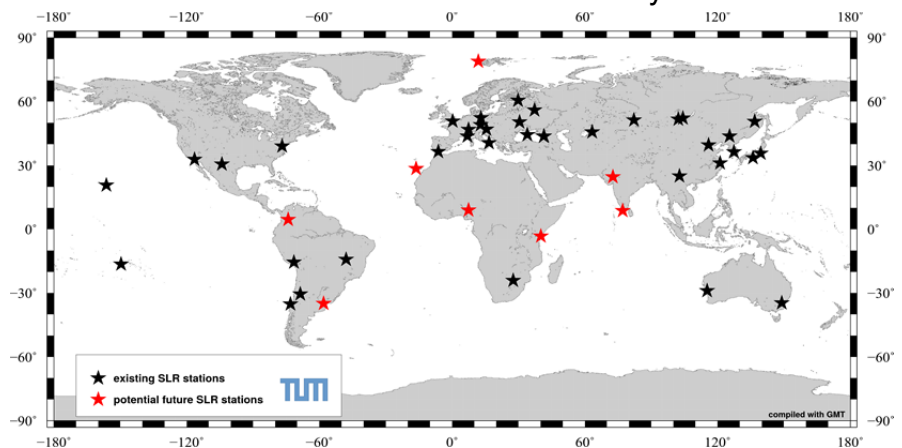


Current topic for a Master's Thesis

Simulations towards a next-generation Satellite Laser Ranging Network

Satellite Laser Ranging (SLR) is a very important space-geodetic technique for the realisation of geodetic reference systems. It is the unique technique that allows for the determination of the geocentre, i.e., the defined origin of a geocentric reference system, with high accuracy. Further, it contributes to the determination of the scale of the system.

Within the upcoming years, the challenge will be the transition from conventional reference frame solutions (that remain valid over many years, e.g. ITRF) to precise *Epoch Reference Frames* (ERF) that are frequently updated (e.g. weekly, monthly) and thus require stable and high-performant globally well-distributed observation networks.



Existing SLR station network (black stars) and SLR stations being considered for the future (red stars).

Within this Master's thesis, the potential of an improved global SLR station network shall be investigated by a simulation approach. The work can focus on the impact of an improved network geometry as well as of an increased amount of observations produced by the existing stations. The results shall be investigated in terms of the quality of the estimated geodetic parameters required to define a global terrestrial reference frame.

Main tasks:

- Simulation of SLR observations with the DGFI-TUM orbit computation software DOGS-OC.
- Assessment of the impact of improved SLR network geometry (additional stations) and/or increased SLR station performances (increased number of observations) on the quality of a reference frame.
- Analysis of the impact of different network constellations on the quality and stability of frequently updated Epoch Reference Frames.
- An outcome of the thesis could be a recommendation how the next-generation SLR network should be improved.

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