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Oral
Current and planned satellite gravimetry missions which track global mass transport, such as the GRACE missions and NGGM, only allow gravity field solutions with a monthly temporal resolution but achieve a high spatial resolution with a low-low satellite-to-satellite tracking approach through the use of a Laser Ranging Interferometer (LRI). The low temporal resolution of these missions is currently limited by the low number of spacecraft due to their high cost.

The SENSORIS mission proposes a constellation of many CubeSat sized spacecraft utilising commercial off the shelf components and tracking via GNSS, thus using high-low satellite-to-satellite tracking. While the use of GNSS restricts the spatial resolution, a significantly higher temporal resolution of one solution per day is achievable due to the increased number of cost-effective spacecraft. SENSORIS thus aims to improve the currently insufficient background models used to create the gravity field solutions of GRACE-like missions whilst simultaneously providing redundancy to these missions.

By implementing an LRI on a SENSORIS-like platform the spatial resolution of the gravity field solutions can be increased in comparison to those provided by GNSS. Compared to GRACE-FO, a significantly more compact LRI is necessary to fit into the required volume of a CubeSat. In order to achieve this, a New Space approach is proposed to allow the use of current state of the art technology which has limited or no space heritage, but allows the lower size, weight and power constraints to be met. While the expected ranging performance of the developed system will initially most likely not match the performance of the full-sized LRI, the first steps towards a compact LRI are under development.

In this contribution we will give an overview of the SENSORIS mission concept as well as our activities towards a compact LRI.
Meeting homepage
GRACE-FO 2025 Science Team Meeting
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