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Mitigating the impact of solar radiation pressure mismodeling in GNSS station position time series

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Time series of GNSS station positions play a central role in the study of Earth's surface deformation and in the realization of terrestrial reference frames. Despite significant progress, these time series remain affected by non-geophysical signals, thereby limiting the investigation of millimeter-level deformations. Among these perturbations, periodic signals of satellite origin —particularly harmonics of the draconitic cycle— are a major source of ground motion uncertainty. These effects are mainly attributed to the imperfect modeling of solar radiation pressure (SRP) acting on the satellites.

This PhD project aims to better understand and reduce the impact of these errors on GNSS position time series. The methodology will rely, on the one hand, on the evaluation and implementation of new SRP models within the CNES GINS software and, on the other hand, on the use of orbital diagnostics such as discontinuities between successive orbital arcs to identify missing accelerations. The ultimate objective is to develop improved SRP models capable of significantly reducing undesired periodic signals, thereby enhancing the precision of GNSS observations for the study of long-term geophysical processes.

Speaker information

PhD 1st year

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