ON-GROUND TORSION PENDULUM TESTING FOR LISA: FORCE NOISE PERFORMANCES AND CHARGE MANAGEMENT SYSTEM INVESTIGATION

The torsion pendulums are able to reproduce free falling conditions for LISA-like test masses on ground at a level that allows to perform significant test of residual stray forces and to characterize the overall gravitational reference sensor (GRS) performance.
We report here on the current force noise performance of a torsion pendulum integrated with an exact copy of the LISA Pathfinder (LPF) GRS, which is the baseline also for LISA. The feasibility of testing the specific disturbances and possible upgrades will be addressed, together with an analysis of the torsion pendulum data, which could give insight into the nature of the low-frequency excess noise observed in the LPF mission.
Finally, we present the details of a measurement campaign dedicated to investigate the performance of the Charge Management System currently foreseen for LISA, that keeps the test masses charge under control by using photo-electron emission with UV light-emitting diodes (LED).