

SYMPOSIUM ON NEW TECHNOLOGIES FOR FUTURE SPACE ASTRONOMY MISSIONS (A7)  
Technology Needs (2) (3)

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SPACE-TIME METROLOGY AND FUNDAMENTAL PHYSICS FROM SPACE (INVITED)

**Abstract**

Space-time precision metrology has been a growing field within space science over the last decades. The field deals with all the measurements at the basis of a metric description of space-time. It includes many different technologies: frequency shifts and time delay measurements with high precision clocks and with different kind of satellites, from low Earth orbit spacecraft to deep-space probes; measurement of precession of spin of gyroscopes and angular momentum of orbiting bodies; measurement of differential accelerations of test bodies due to space-time curvature in the presence of gravitation, or to violations of the Equivalence principle. The impact of this active field is not just on Fundamental Physics. Mapping of the Earth gravity field by GOCE or Grace is one obvious example. Even more remarkable, is the impressive impact that LISA and gravitational-wave astronomy promise to have on Relativistic Astrophysics, Astronomy at large, and Cosmology. The talks will review the main mission and studies in the field, from gravitational wave detectors, to tests of equivalence principle and to high precision clocks in space.