



Informal Workshop

“Galileo Galilei” (GG) and GGG lab prototype: state of the art and new possibilities” 10-12 February 2010 (Pisa/San Piero a Grado)

Motivation

The GG (“Galileo Galilei”) satellite experiment aims to test the Equivalence Principle to 10^{-17} , an extremely ambitious goal (due to improve current best results by 4 orders of magnitude) that should tell us in a clear cut way whether we are in the presence of a new long-range physical interaction (violation) or not (confirmation). Either way, it would be a major result. This informal workshop is motivated by the possibility –first proposed by Slava Turyshev– that a laser gauge of the type developed at JPL for SIM (Space Interferometry Mission) may be used in GG to measure the relative displacements of the test masses, instead of the capacitance transducer currently planned for GG and tested in the GGG laboratory prototype. Following an email discussion, the best understanding of GG/GGG on one side and of SIM laser gauges on the other are brought together at this meeting to establish the viability of the proposal and set up ways of collaboration.

Program

February 10, 2010 (Starting 9 am, INFN San Piero - GGG lab first and then main INFN building 1st floor, meeting room, Via Livornese 1291 San Piero a Grado – Lunch catering in San Piero)

After a Tour of the GGG lab (~1hr) the day will proceed with informal discussions introduced and driven by the following presentations

- *GGG best results, relevance to GG and evidence for passive reduction of low frequency terrain tilts* (~20' - A. Nobili)
- *Capacitance sensing electronics: state of the art worldwide, current status in GGG and prospects for improvement* (~20' - R. Pegna)
- *SIM-like laser gauge and adaptation to GG* (~20' - M. Shao)

February 11, 2010 (Starting 9 am at INFN San Piero, main building as day before – Afternoon in Pisa, see below; lunch catering in San Piero, dinner in Pisa)

Discussion will continue from the previous day after a general

- *Overview of the GG space experiment current design* (~20' - A. Nobili)

In the afternoon participants will move to Pisa (INFN&Department of Physics) for a general talk by M. Shao

16:30 Seminar by Michael Shao (Largo Bruno Pontecorvo 3, Building C, ground floor, Room 131)

- *Laser metrology on SIM (Space Interferometry Mission): Accuracy and signal-to-noise ratio*

February 12, 2010 (Starting 9 am, INFN San Piero a Grado - Main INFN building 1st floor, meeting room, Via Livornese 1291; lunch catering in San Piero)

Last day discussion will be introduced by the following presentations:

- *The GG satellite mission: synthesis of the 2009 ASI Phase A2 study* (~20'- A. Anselmi, A. Sposito)
- *GG error budget from the end-to-end simulator developed at TAS-I* (~20' - G. Catastini)
- *Optical metrology applications at TAS-I (Turin) in support of gravity and fundamental physics* (15' - S. Cesare)
- *The new space science DLR Institute in Bremen and Fundamental Physics* (20' - H. Dittus)