MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
Gravity and Fundamental Physics (1)

Author: Dr. Francesco Vespe
Agenzia Spaziale Italiana (ASI), Italy, francesco.vespe@asi.it

Ms. Vincenza Luceri
e-GEOS, Italy, cinzia.luceri@e-geos.it
Dr. Elisa Rosciano
Matera Space Geodesy Center, Agenzia Spaziale Italiana (ASI), Italy, elisa.rosciano@est.asi.it

GALILEO SATELLITES DORESA AND MILENA IN WRONG ECCENTRIC ORBITS: I.E. HOW TRANSFORM A PROBLEM IN A RESOURCE

Abstract

On August 22nd 2014 , the Galileo satellites 205 206 (DORESA and MILENA) were launched on wrong orbits. If the injection of the two satellites on wrong highly eccentric orbits (e=0.256 then reduced after recovery manoeuvres to 0.156) jeopardized the full operation of two satellites for navigation civilian purposes; on the other hand it has provided the unique opportunity to have satellites fully suitable for scientific investigations. Satellites with so eccentric orbits can be exploited for investigations in the field of General Relativity and Gravitation. Gravitational red-shift, Schwarschild perigee precession and Lense-Thirring gravitomagnetic field are the main General Relativistic effects that can be measured with unprecedented accuracy today thanks to DORESA e MILENA. Furthermore bounds on alternative theories of gravitation now can be settled.Those bounds are for example helpful to constrain possible deviations from the inverse-square of gravitation law parameterized by a Yukawa-like new long range interaction or Moffat alternative theory. Finally they concur to establish a relativistic positioning systems based just on GALILEO satellites.