
GR 2: Main talk: Experimental Gravitation

Time: Monday 11:25–12:10

Location: SPA Kapelle

Invited Talk

GR 2.1 Mon 11:25 SPA Kapelle

Modern tests of Special Relativity using cryogenic electromagnetic resonators — ●ACHIM PETERS — Humboldt Universität zu Berlin, Institut für Physik, AG Optische Metrologie, Newtonstr. 15, 12489 Berlin, Germany

Ultra-stable electromagnetic resonators are an exquisite tool for performing precision tests of Lorentz invariance and Special Relativity.

In this talk I will first present results from a recently concluded Michelson-Morley type experiment using two orthogonally aligned

cryogenic sapphire microwave oscillators (CSOs) actively rotated on a high-precision air-bearing turntable. After more than one year of almost continuous operation, the sensitivity of this setup to Lorentz invariance violations has now reached the 10^{-18} to 10^{-19} regime.

In the next version of this experiment these microwave oscillators will be combined with a new generation of ultra-stable cryogenic optical resonators (COREs). I will present first results from measurements utilizing these COREs and then discuss the prospects for using the new setup to investigate simultaneously a multitude of possible Lorentz invariance violations in the 10^{-20} to 10^{-21} regime.