Master's Thesis

Arbeitsgruppe Quantum Optical Metrology (QOM)
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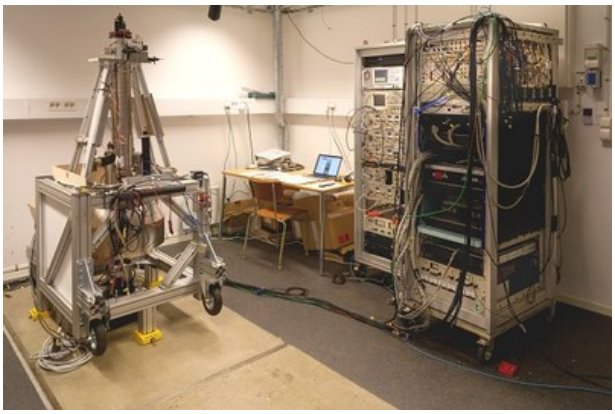
Atom interferometry for geodetic applications and tests of quantum mechanics

Our gravimetric atom interferometer GAIN is based on interfering ensembles of laser-cooled rubidium in an atomic fountain using stimulated Raman transitions. Using a Mach-Zehnder configuration which is sensitive to inertial forces, we have already demonstrated some of the best performance as an absolute gravity sensor in terms of accuracy, sensitivity and long-term stability. GAIN is designed as a mobile device which allows its transport to sites of interest and has already demonstrated its potential for Earth observation during several measurement campaigns at geodetic observatories.

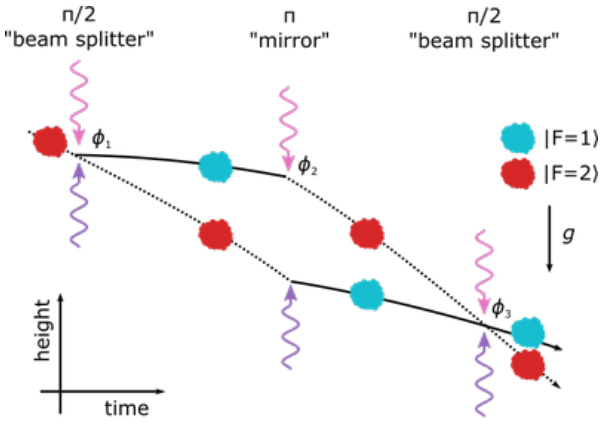
We are currently upgrading our setup for improved reliability and accuracy as a mobile quantum gravity sensor. These improvements are also an important step towards proposed tests of quantum mechanics with our experiment, we want to realize in the near future.

In this context, we are looking for highly motivated Master students in the fields of experimental physics and optical sciences to join us. The main tasks will be the implementation of new atom interferometer schemes and the investigation for systematic effects.

A background in atomic and laser physics is desired. If you're interested don't hesitate to contact us.



Gravimetric Atom Interferometer GAIN



Principle of Mach-Zehnder atom interferometer

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