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Atom interferometry on ground and in space

**Abstract**

Atom interferometers are widely used for measuring inertial forces such as acceleration and rotation with high accuracy. Apart from the application in metrology, geodesy or geophysics also fundamental questions like the validity of the equivalence principle are addressed within these experiments.

Since the sensitivity of these sensors scales quadratically with the free evolution time, the operation in microgravity environments is investigated. The use of ultra-cold Bose-Einstein condensates (BEC) overcomes limitations set by the finite size and temperature of laser cooled atoms, which are commonly used in today's atom interferometry devices.

In my talk I will give an overview of the activities within the QUANTUS collaboration. These include gravimetry on ground, matter-wave optic experiments in the drop-tower as well as the creation of the first BEC on a sounding rocket in space paving the way for future spaceborne missions.