



Contribution ID: 99

Type: **Talk**

[327] GRASIAN: Towards the first demonstration of gravitational quantum states of atoms

Wednesday 6 September 2023 16:00 (15 minutes)

At very low energies, an atom above a horizontal surface can experience quantum reflection due to the attractive Casimir-Polder potential. The quantum reflection holds the atom against gravity and leads to quantum gravitational states (GQS), in analogy to what has been observed with ultracold neutrons.

The GRASIAN-collaboration pursues the first measurement of GQS of atomic hydrogen. The use of hydrogen is not only motivated by the fact, that GQS have never been observed with atoms. The enhanced statistics available through the use of hydrogen atoms (versus ultracold neutrons) will increase the sensitivity to deviations from Newtonian Gravity.

Theoretical Work

Primary author: KILLIAN, Carina (Austrian Academy of Sciences (AT))

Co-authors: WIDMANN, Eberhard (Austrian Academy of Sciences (AT)); NEZ, Francois (Laboratoire Kastler Brossel (FR)); SCHREINER, Katharina; HANSKI, Otto (University of Turku); CRIVELLI, Paolo (ETH Zurich (CH)); YZOMBARD, Pauline; BLUMER, Philipp Peter (ETH Zurich (CH)); VASILIEV, Sergey (University of Turku); Prof. NESVIZHEVSKY, Valery

Presenter: KILLIAN, Carina (Austrian Academy of Sciences (AT))

Session Classification: Nuclear, Particle- & Astrophysics (TASK - FAKT)

Track Classification: Nuclear, Particle- and Astrophysics (TASK)