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qBounce: first measurement of the neutron's electric charge with a Ramsey-type GRS experiment

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The qBounce collaboration successfully commissioned a new Ramsey-type gravitational resonance spectroscopy (GRS) setup at the Institute Laue-Langevin (Grenoble). This increases the achievable sensitivity significantly with respect to previous implementations. In 2018, we measured the gravitational state transitions with the new setup. This Ramsey-type implementation is not only sensitive to a range of hypothetical variations of Newtonian potential at the micrometer scale, but also enables to test the electric charge neutrality of the neutron. We present the results of the first neutron charge measurements and give an outlook on future developments.

Primary author: BOSINA, Joachim (Atominstitut, TU Wien)

Co-authors: ABELE, Hartmut (Atominstitut); MICKO, Jakob; SEDMIK, René; JENKE, Tobias (Institut Laue-Langevin)

Presenter: BOSINA, Joachim (Atominstitut, TU Wien)

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