

Abstract Submitted
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Towards a test of Einstein's equivalence principle using a Rb-K atom interferometer DENNIS SCHLIPPERT, JONAS HARTWIG, ULRICH VELTE, HENNING ALBERS, JONAS MATTHIAS, WOLFGANG ERTMER, ERNST RASEL, Institut fuer Quantenoptik, Leibniz Universitaet Hannover — We report on our work directed towards a dual species matter-wave interferometer for performing a differential measurement of the acceleration of free falling ^{87}Rb and ^{39}K atoms with the aim to test the universality of free fall and hence Einstein's equivalence principle. According to the minimal Standard Model Extension such a test is very sensitive to composition based equivalence principle violating effects and complementary to classical tests. Simultaneous dual species operation guarantees high common noise suppression. We will show the environmental noise limited performance of the single species rubidium gravimeter ($7.84 \cdot 10^{-6} \text{ m/s}^2/\sqrt{\text{Hz}}$ and $3.86 \cdot 10^{-8} \text{ m/s}^2 @ 49152 \text{ s}$) in comparison to a classical accelerometer and the implementation progress of the potassium gravimeter.

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