

Abstract Submitted
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Dipole Trapping under Microgravity¹ CHRISTIAN VOGT, MARIAN WOLTMANN, SVEN HERRMANN, CLAUS LMMERZAHN, ZARM, University of Bremen, PRIMUS TEAM — The PRIMUS-Project will be testing the weak equivalence principle (WEP) with a two species (Rb and K) atom interferometer under microgravity. Microgravity offers the benefit of largely extended free evolution times of the atomic ensembles, which significantly enhances the sensitivity. As microgravity platform we chose the drop tower in Bremen, a free fall tower with a height of 110m, which allows for a free fall time of 4,7s and excellent microgravity quality. Contrary to similar projects using an atomic chip (e.g. CAL or QUANTUS), the cold atomic ensembles will be prepared in a dipole trap with a wavelength of about 2m and a maximum Power of about 10W directly loaded from a 3D-MOT. Dipole Traps have several advantages like a symmetric trap shape and the availability of Feshbach Resonances. They are well established in ground based experiments and will most likely play a major role in space born cold atom experiments. In this manner our project also serves as a pathfinder experiment for further cold atom tests of fundamental physics. Within this work we were just recently able to produce the first dipole trap under microgravity. The talk will be about the current status of the project.

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