

Abstract Submitted
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A Flight Capable Atomic Gravity Gradiometer With a Single Laser¹ STORM WEINER, University of California, Berkeley, XUEJIAN WU, ZACHARY PAGEL, DONGZON LI, JACOB SLECZKOWSKI, FRANCIS KETCHAM, HOLGER MUELLER, UC - Berkeley — Here we present an atom interferometer which will measure vertical gravity gradients using a single laser diode, while mounted on an 6-rotor unmanned aerial vehicle (UAV). We will measure gravity gradients by ellipse-fitting the phases from two identical, vertically displaced interferometers in the same vacuum chamber with common Raman lasers and trapping beam. Each interferometer will have a baseline of $T = 150$ ms, displaced 1 m relative to each other. We propose a novel mechanism to generate two magneto-optical traps (MOTs) with a single incoming beam using a diffraction grating inspired by previous grating MOTs. The entire science payload, including vacuum chamber, optics, and all control electronics, is budgeted to weigh < 70 kg, and the aircraft is rated to carry 110 kg for 30 minutes.

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