

Abstract Submitted
for the DAMOP20 Meeting of
The American Physical Society

Atom-interferometric test of the equivalence principle CHRIS OVERSTREET, PETER ASENBAUM, MINJEONG KIM, MARK KASEVICH, Stanford Univ — The equivalence principle, which states that gravitational effects cannot be observed in any local experiment, is the foundation of our understanding of gravity. Its validity has been tested to high precision with torsion balances, lunar laser ranging, and a free-fall measurement in space. Here we present the results of an atom-interferometric test of the equivalence principle between ^{85}Rb and ^{87}Rb . We demonstrate a relative precision of 2×10^{-11} per shot by using a long drift time $T \sim 1$ s and a large momentum transfer of up to $12 \hbar k$. Our results provide general constraints on extensions of the Standard Model and on alternative theories of gravity.

Chris Overstreet
Stanford Univ

Date submitted: 30 Jan 2020

Electronic form version 1.4