Abstract Submitted
for the DAMOP12 Meeting of
The American Physical Society

High data-rate atom interferometer for measuring acceleration[1]
AKASH RAKHOLIA, University of New Mexico, HAYDEN MCGUINNESS, GRANT BIEDERMANN, Sandia National Laboratories — Atom interferometers have the potential to be exceptional broadband inertial sensors in both translational and rotational degrees of freedom. The demonstrated performance of this technology rivals the best ring-laser gyroscopes and falling corner-cube gravimeters. However, compact and field-worthy manifestations of atom interferometers remain elusive using standard approaches. Furthermore, bandwidths have typically been limited to a few Hertz, which is insufficient for a broader application space. We demonstrate a high data-rate light-pulse atom interferometer for measuring acceleration. The device is optimized to operate at rates between 50 Hz to 330 Hz with sensitivities of 0.57 micro-g/rtHz to 36.7 micro-g/rtHz, respectively. Our method offers a dramatic increase in data rate and demonstrates a path to new applications in highly dynamic environments.

[1]This work was supported by Laboratory Directed Research and Development at Sandia National Laboratories.

Akash Rakholia
University of New Mexico

Date submitted: 27 Jan 2012 Electronic form version 1.4