Abstract Submitted
for the DAMOP20 Meeting of
The American Physical Society

Integrated atomic waveguides for atom interferometry (AI) WILLIAM KINDEL, ADRIAN OROZCO, KATHERINE MUSICK, CHRISTINA DALLO, ANDREW STARBUCK, ANDREW LEENHEER, YUAN-YU JAU, Sandia National Laboratories, GRANT BIEDERMANN, University of Oklahoma, MICHAEL GEHL , JONGMIN LEE, Sandia National Laboratories — We present our progress developing integrated photonic waveguides for guided atom interferometry (AI). This is a promising platform for position, navigation and timing (PNT) sensors because atom interferometry is among the most sensitive techniques for inertial detection, and these integrated waveguides provide new paths for developing scalable and modular devices with low size, weight and power (SWaP) requirements. However, prohibitive technical challenges remain. For instance, atoms have yet to be trapped in the evanescent fields of integrated waveguides due to limited heat dissipation of these guides in vacuum. To address these challenges, we are developing alumina membrane rib waveguides with engineered heat dissipation. We present our designs and power handling of these suspended waveguide bridges and our progress towards trapping Cs atoms and performing guided atom interferometry on them. *Sandia National Laboratories is a multimission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.*

William Kindel
Sandia National Laboratories

Date submitted: 31 Jan 2020 Electronic form version 1.4