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Characterizing Errors in Entangled-Atom Interferometry BRANDON RUZIC, CONSTANTIN BRIF, GRANT BIEDERMANN, Sandia National Laboratories — Recent progress in generating entanglement between neutral atoms provides opportunities to advance quantum sensing technology. In particular, entanglement can enhance the performance of accelerometers and gravimeters based on light-pulse atom interferometry. We study the effects of error sources that may limit the sensitivity of such devices, including errors in the preparation of the initial entangled state, spread of the initial atomic wave packet, and imperfections in the laser pulses. Based on the performed analysis, entanglement-enhanced atom interferometry appears to be feasible with existing experimental capabilities. This work is supported by the Laboratory Directed Research and Development program at Sandia National Laboratories. 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.

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