

Abstract Submitted
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Simultaneous Multi-Axis Inertial Sensing with Compact Point Source Atom Interferometry AZURE HANSEN, NIST Boulder, YUN-JIHH CHEN, NIST Boulder, University of Colorado Boulder, ELIZABETH A. DONLEY, JOHN E. KITCHING, NIST Boulder — Point-source atom interferometry (PSI) makes use of the thermal velocity distribution in a cloud of cold atoms to measure two axes of rotation and one axis of acceleration in a single measurement run. With a simpler experimental implementation than typical atom interferometer gyroscopes, PSI has potential as a compact instrument in resilient positioning and navigation. Given the limited expansion time in a centimeter-scale PSI system, such measurements are typically done outside the point-source limit. The gyroscope scale factor therefore depends on the initial and final cold atom cloud sizes and shapes and their stability over time. Here we characterize the biases and challenges specific to compact systems and methods to overcome them.

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