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Optimizing Point Source Atom Interferometry for Inertial Navigation YUN-JHIH CHEN, AZURE HANSEN, GREGORY HOTH, EUGENE IVANOV, JOHN KITCHING, ELIZABETH DONLEY, NIST - Boulder — To move atom interferometry from laboratories to navigational applications, we evaluate the technique of point source atom interferometry (PSI) [1]. With PSI, the Raman $\pi/2 - \pi - \pi/2$ pulse sequence is applied to a ballistically expanding cloud of cold atoms. Because of the correlation between final position and atom velocity, a spatial sinusoidal fringe pattern arising from rotations is imprinted on the atom population at the end of the pulse sequence. By imaging the fringe pattern, the PSI technique simultaneously measures acceleration in the propagation direction of the Raman lasers and rotation in the plane perpendicular to that direction. This simple experimental geometry makes the technique promising for miniaturization. We have previously demonstrated a PSI gyroscope, which used a vacuum volume of 1 cm^3 [2]. We will present our ongoing work on optimizing the system.

Dickerson *et al.*, Phys. Rev. Lett., **111**, 083001 (2013)

Hoth *et al.*, Appl. Phys. Lett., **109**, 071113 (2016)

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