

Abstract Submitted
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A half-degenerate optical resonator for cold-atom interferometry¹

RANJITA CHANU SAPAM, NICOLAS MIELEC, ARNAUD LANDRAGIN, REMI GEIGER, LNE-SYRTE, Observatoire de Paris, PSL Univ. Paris, CNRS, Sorbonne Univ — We present the analysis of a half degenerate optical resonator consisting of a lens located between two plane mirrors. This resonator was designed to support a large waist (cm) Gaussian beam for applications to precision inertial measurements based on large momentum transfer atom interferometry. We investigate the spatial profile of the resonating beam, and the optical gain for different beam size, and the influence of misalignments on the degeneracy of the cavity. FFT simulations show that aberrations and surface imperfections of the optics are the main contributors to spatial inhomogeneities of the resonating beam, which supports our experimental results. We also report the stability of this resonator locked to an ultra-stable optical reference.

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