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We investigate the fundamental limits of Large Momentum Transfer (LMT) Atom Interferometry by using the Bloch oscillations of atoms in optical lattices. A thorough theoretical framework for Bloch oscillation-enhanced atom interferometry is presented and validated through a comparison with numerical solutions of the Schrödinger equation. This establishes design criteria to reach the fundamental efficiency and accuracy limits of large momentum transfer using Bloch oscillations. We apply our findings to current state-of-the-art experiments and make projections for the next generation of quantum sensors. Finally, we outline future steps to include the effects of the lattice potential in transverse direction towards a more realistic description. This will facilitate our ability to perform comprehensive analyses of the statistical and systematic errors for future Bloch-en

Poster Abstract

Session Classification: Poster Session & Wine & Coffee