Scalable momentum splitting in a dual lattice configuration

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Bose-Einstein condensates (BEC) in combination with scalable momentum splitting are two key components for future infrasound atomic gravitational wave detectors.
We present a novel atom interferometer taking advantage of the symmetric nature of double Bragg diffraction and the narrow velocity distribution of our delta-kick collimated Bose-Einstein condensate. Using a combination with Bloch oscillations in a dual lattice we achieve symmetric scalable momentum splitting allowing us to coherently transfer up to 1008hk. In a Mach-Zehnder-type interferometer contrast has been observed up to a path separation of 408hk corresponding to a total transfer of 1632 photon recoils, limited by technical contraints.