Twin-lattice interferometry

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Optical twin-lattices make a new class of interferometers possible. They allow to form symmetric interferometers by creating counter-propagating matter waves with large momentum out of a BEC. We have formed interferometers with a momentum separation of more than 400 photon recoils and a total scattering of far more than thousand photons. So far our method is limited by technical rather than fundamental reasons, which makes the method promising for approaching the sensitivities required for gravitational detection. Based on twin lattices, we present a new promising concept for infrasound gravitational wave detection.

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