

Twin lattice interferometry - a tool for gyros and gravitational-wave detection

Ernst M Rasel

Ernst M. Rasel for the QUANTUS and qgyro cooperation Leibniz Universität Hannover and Excellence Cluster Quantum Frontiers Welfengarten 1, 30167 Hannover, Germany, +49 511 19203, rasel@iqo.uni-hannover.de

Ultra-cold quantum gases promise to boost the sensitivity of inertial matter-wave interferometers. A long-standing application is the high-precision measurement of rotations, where the device sensitivity scales with the area enclosed by the interferometer. Compared to light matter waves show a larger intrinsic sensitivity and hence, these interferometers require to enclose smaller surfaces. However, beam splitters based on light-pulses achieved so far rather modest relative velocities in atom interferometers. Here, twin-lattice interferometry exploiting ultra-cold quantum gases opens up a new perspectives for atom-interferometric rotation measurements.