Atom-chip based interferometers

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Atom chips have been facilitating enormously the generation of Bose-Einstein condensates. We recently demonstrated that all manipulations for performing atom interferometry can be done on the atom chip in a coherence preserving way and without heating. These devices allow to achieve a high flux of ultra-cold atoms, extremely low expansion rates of these wave packets and make it possible to realise new interferometers. We have also shown that these devices allow to realise compact quantum gravimeters for ground based measurements. Last but not least, in 2014, we plan to test these devices in the catapult and on a sounding rocket mission to extend atom interferometry to unprecedented time scales.

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