Atom interferometry with alkali earth atoms

Today, matter-wave interferometers such as clocks and gravimeters allow for precision measurements of time and gravity at unprecedented levels. In all these sensors, the exquisite control of both internal (electronic) and external (center of mass motion) degrees of freedom of ultra-cold atomic samples, enable us to study interactions at their most basic, quantum level, paving the way for new tests of fundamental physics.

In these lessons, I'll focus on all possible implementations of alkali-earth atoms in atom interferometry schemes involving two-photon and single-photon transitions. Moreover, the experimental results toward the production of ultra-cold cadmium for atom interferometry and prospects for tests of fundamental physics will also be discussed*.

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