

Sagnac Interferometry with Cold Atoms (CASI)

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Matter wave interferometers are important tools in fundamental physics and metrology. The sensitivities obtained with such devices compete with current state-of-the-art sensors in measuring accelerations [1] and rotations [2]. My talk will present a new project **CASI** at the IQO to realize a high precision Sagnac Interferometer. Using cold atoms the experiment aims to achieve sensitivities of 2×10^{-9} rad/s/ \sqrt{Hz} for an interferometer length as short as 15 cm. Rotations and accelerations will be discriminated by synchronous operation of two counter-propagating beams of ultra-cold atoms. The setup shall be transportable and demonstrate the possibilities of compact sensors for experiments in Space with unprecedented precision [3]. The flexible design allows to test interferometers of different sensitivities and topologies. An overview of the concept and the parameters of our future interferometer as well as the current status of the experimental realization will be reported in the talk.

[1] A. Peters, K.Y. Chung, and S. Chu, *Metrologia* **38**, 25 (2001)

[2] T.L.Gustavson, A. Landragin, and M.A. Kasevitch, *Class. Quantum Grav.* **17**,2385 (2000)

[3] HYPER, Assessment study report, ESA-SCI(2000)10