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CARIOQA : A PATHFINDER FOR SPACE ATOM INTERFEROMETRY

A strong potential for space applications is anticipated from the performances of inertial sensors based of cold atom interferometry on ground. Spatial geodesy missions could benefit from the high level of stability and accuracy demonstrated by these instruments [Carraz et al. 2014]. Mission proposals aiming at testing fundamental laws of physics in space are also based on atomic sensors [Tino et Al. 2013].
Cold atom interferometers are expected to benefit greatly from space environment. Microgravity will cancel the limit on interrogation time set by gravity on Earth, potentially allowing for a gain in sensitivity of several orders of magnitude. However, new technological challenges have to be overcome to reach the full potential required for future scientific missions. The CARIOQA project aims at developping a pathfinder in a relatively short timescale, that will pave the way for ambitious space missions based on cold atom interferometry. It will allow to demonstrate key features of space atom interferometry such as seconds long interrogation time and active rotation compensation.
1 Carraz O. et al., Microgravity Science and Technology volume 26, pages 139–145 (2014).
2 Tino G. et al., Nuclear Physics B - Proceedings Supplements, Volumes 243–244, pages 203-217 (2013).

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