



Towards sympathetic cooling and quantum logic based readout of single trapped (anti-)protons

CPT test, g-factor measurement, quantum logic operations, optical manipulation system, imaging system

Summary

We present quantum logic inspired manipulation and detection schemes for a CPT test experiment based on a g-factor comparison between single trapped protons and antiprotons. The basic idea is to cool, detect and manipulate single trapped (anti-)protons through their interaction with a co-trapped and laser-cooled atomic ion following the proposal by Heinzen and Wineland [1]. We discuss ion trap geometries and spin state transfer schemes as well as laser systems and optical systems for manipulating and detecting the atomic ion. We acknowledge funding by the ERC (ERC StG “QLEDS”). This project is supported by the BASE collaboration. [1] Heinzen and Wineland, PRA 42, 2977 (1990)

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