Physics > Atomic Physics

Measurement of Positronium hyperfine splitting with quantum oscillation

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(Submitted on 24 Feb 2010)

Interference between different energy eigenstates in a quantum system results in an observable oscillation with a frequency which is proportional to the difference in energy between the states. Such an oscillation is observable in positronium when it is placed in a magnetic field. In order to to measure the hyperfine splitting of positronium we perform the precise measurement of this oscillation using a high quality superconducting magnet and fast photon-detectors. A result of 203.324 $\pm$0.039(stat.)$\pm$0.015(sys.) GHz is obtained which is consistent with both theoretical calculations and previous precision measurements. The relaxation of positronium spin is also discussed.

Comments:	4 figures. submitted to Phys. Lett. B
Subjects:	**Atomic Physics (physics.atom-ph)**; Materials Science (cond-mat.mtrl-sci); High Energy Physics - Experiment (hep-ex); Quantum Physics (quant-ph)
Report number:	U.Tokyo ICEPP-Report 2010-01
Cite as:	**arXiv:1002.4567v1 [physics.atom-ph]**

Submission history

From: Shoji Asai [view email]

[v1] Wed, 24 Feb 2010 15:55:17 GMT (82kb)

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