

Measurement of Positronium hyperfine splitting with quantum oscillation

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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 $203.324 \pm 0.039(\text{stat.}) \pm 0.015(\text{sys.})$ GHz is obtained which is consistent with both theoretical calculations and previous precision measurements. The relaxation of positronium spin is also discussed.

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