

## Higher order corrections to the positronium hyperfine splitting

*Monday, 15 September 2014 10:00 (30 minutes)*

The positronium ground state hyperfine splitting (hfs) has long been of interest as a high-precision test of our understanding of binding in QED. The positronium hfs is particularly sensitive to recoil effects (because the ratio of masses is one) and to virtual electron-positron annihilation, but positronium is insensitive to strong and weak interaction effects. Consequently, the comparison between theory and experiment for the positronium hfs, and more generally the positronium spectrum, tests different aspects of the theory compared to comparisons in other exotic atoms. For the past fifteen years there has been a persistent discrepancy between predicted and measured values of the positronium hfs of about four standard deviations (although a new experimental result is consistent with present theory). Recent experimental work at the University of Tokyo, the University of California Riverside, and related work at ETH Zurich is leading to new high-precision measurements, and the calculation of three-loop corrections has begun. The status of the positronium hfs problem and a discussion of recent progress will be the topic of my talk.

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