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## Measurement of the C-forbidden $2^3S_1 \rightarrow 2^1P_1$ transition in positronium

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We report the results of a new measurement of the  $2^3S_1 \rightarrow 2^1P_1$  transition ( $\nu_F$ ) in positronium (Ps). Though this transition is forbidden by charge conjugation symmetry (C), it can be observed in a magnetic field. We optically excite Ps from a pulsed beam to produce radiatively metastable  $2^3S_1$  atoms and drive them to the  $2^3P_1$  level in a rectangular waveguide using microwave radiation. The C-allowed  $2^3S_1 \rightarrow 2^3P_1$  transition ( $\nu_1$ ) was also measured in the same waveguide, using the same techniques, and the observed Zeeman shift was used to determine the local magnetic field strength. The measurements were performed in a range of magnetic fields, making it possible to determine the field-free  $\nu_1$  and  $\nu_F$  transition frequencies, and to set limits on the C-forbidden transition matrix element  $|\langle 2^1P_1 | H_{CP} | 2^3P_1 \rangle|$

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