

Abstract Submitted
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Measurement of a forbidden magnetic dipole matrix element in Rb T. TAKEKOSHI, R.J. KNIZE, US Air Force Academy — For non-relativistic wavefunctions, the Rb 5S to 6S transition is E1 and M1 forbidden. For relativistic wavefunctions, the leading term is M1. The value of this lowest nS to (n+1)S matrix element has been calculated for all of the alkali atoms using relativistic many-body perturbation theory by Savukov, Derevianko, Berry, and Johnson [PRL **83** 2914 (1999)]. Their predicted value of the Cs 6S to 7S matrix element is within 16% of the high-precision (<1%) value measured by Bennett and Wieman [PRL **82** 2484 (1999)]. The Rb 5S to 6S M1 matrix element is predicted to be especially sensitive to contributions from negative-energy states. Including negative-energy states changes the calculated value by 60%. We attempt a measurement of this matrix element at the 10% precision level to investigate this effect.

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