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Lifetime Measurement of the $8s$ Level in Francium E. GOMEZ, G. D. SPROUSE, SUNYSB, L. A. OROZCO, A. PEREZ-GALVAN, UMD — We present a measurement of the lifetime of the $8s$ level on a magneto-optically trapped sample of ^{210}Fr atoms using time-correlated single-photon counting. This measurement presents a test for the many body perturbation theory calculations in a strongly relativistic atom. The $8s$ level bears special importance for its possible use in optical parity non- conservation experiments. The $7P_{1/2}$ state serves as the resonant intermediate level in the two-step excitation to the $8s$ level completed with a $1.3\ \mu\text{m}$ laser. Analysis of the fluorescence decay through the $7P_{3/2}$ level gives the lifetime of the $8s$ level. We complement the study of systematic effects by performing the measurement in the equivalent level in Rb. The final result has an uncertainty of better than 1 % dominated by statistics and agrees with theoretical calculations. This work is supported by NSF, EG acknowledges support from CONACYT.

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