

Abstract Submitted
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Precise lifetime of the metastable $^2P_{1/2}$ state in Ar^{9+} ions isolated in a Penning trap¹ JOSEPH TAN, NIST - Natl Inst of Stds & Tech, SAMUEL BREWER, Univ. of Maryland, College Park, MD 20742, JOAN DREILING, SHANNON HOOGERHEIDE, NICHOLAS GUISE, NIST - Natl Inst of Stds & Tech, AUNG NAING, Univ. of Delaware, Newark, DE 19716 — A measurement with <1% statistical uncertainty is presented for the radiative decay lifetime of the metastable $^2P_{1/2}$ state in the ground-state fine structure of fluorine-like Ar^{9+} (one hole in the filled $2p$ subshell). The method involves the extraction of multiply-ionized Ar atoms from an electron beam ion trap (EBIT) and the capture of only Ar^{9+} ions in a compact Penning trap. The $^2P_{1/2}$ state of the stored Ar^{9+} ions can spontaneously decay via M1 (spin-flip) radiative transition to the ground state, with the photon emission monitored using a photomultiplier tube and a multichannel scaler. Improvements that reduced measurement uncertainty are discussed. The results are compared with theory and prior measurements.

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