

Abstract Submitted
for the DAMOP20 Meeting of
The American Physical Society

Measurement of the lifetimes of the $7p^2P_{3/2}$ and $7p^2P_{1/2}$ states of atomic cesium¹ AMY DAMITZ, GEORGE TOH, NATHAN CHALUS, ANDREW BURGESS, POOLAD IMANY, DANIEL E. LEAIRD, ANDREW M. WEINER, Purdue Univ, CAROL E. TANNER, University of Notre Dame, D. S. ELLIOTT, Purdue Univ — We report measurements of the lifetimes of the $7p^2P_{3/2}$ and $7p^2P_{1/2}$ states of cesium, ^{133}Cs . We collect the fluorescence from the spontaneous decay of atoms in the excited $7p^2P_{3/2}$ and $7p^2P_{1/2}$ states and employ a time-correlated single-photon counting technique to obtain the lifetimes of these states. We use these measurements with previous determinations of other electric dipole matrix elements of cesium to determine the $\langle 5d^2D_{5/2} || r || 7p^2P_{3/2} \rangle$, $\langle 5d^2D_{3/2} || r || 7p^2P_{3/2} \rangle$, and $\langle 5d^2D_{3/2} || r || 7p^2P_{1/2} \rangle$ electric dipole matrix elements for cesium. The lifetimes and determined matrix elements provide a test of theoretical methods for calculating precise models of the electronic structure of cesium.

¹We acknowledge support from the National Science Foundation under Grant Number PHY-1607603, 1839191-ECCS, and PHY-1852501

Amy Damitz
Purdue Univ

Date submitted: 31 Jan 2020

Electronic form version 1.4