

Abstract Submitted  
for the DAMOP18 Meeting of  
The American Physical Society

**Lifetime measurement of  $nD_{3/2}$  and  $nD_{5/2}$  Rb Rydberg states.**<sup>1</sup>

BARBARA F. MAGNANI, CRISTIAN A. MOJICA CASIQUE, LUIS G. MARCASSA, Universidade de Sao Paulo — Accurate measurements of the lifetime of Rydberg states can provide powerful tests for theoretical calculations of dipole matrix elements, oscillator strengths, core polarizabilities, and influence of blackbody radiation on radiative lifetimes. Alkali atoms have been used both theoretically and experimentally as prototypes for the study of these problems. The most accurate values for Rb Rydberg lifetimes to date have been measured in a magneto optical trap at a room-temperature environment [1]. In this work, we have measured the lifetime of  $nD_{3/2}$  and  $nD_{5/2}$  states of Rb as a function of principal quantum number using a cw 480 nm laser for Rydberg excitation. We have used a 1064 nm laser to measure the photoionization rate as well. We will present the description of the experimental setup, followed by the results and the discussion, in which we present a comparison of our measurement with existing theory [2]. [1] L. G. Marcassa, Phys. Scr. T134, 014011 (2009) [2] I. I. Beterov, I. I. Ryabtsev, D. B. Tretyakov, and V. M. Entin, Phys. Rev. A 79, 052504 (2009).

<sup>1</sup>This work was supported by Sao Paulo Research Foundation (FAPESP) Grants 2013/02816- 8 and 2016/21311-2, the U.S. Air Force Grant FA9550-16-1-0343 and CNPq.

Luis Marcassa  
Universidade de Sao Paulo

Date submitted: 01 Jan 2018

Electronic form version 1.4