

Abstract Submitted
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Excitation of a single atom with a temporally shaped light pulses
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/ National Univ. Singapore — We investigate the interaction between a single
atom and coherent optical pulses with a controlled temporal envelope. By switching
the temporal shape from rising exponential to square profile, we show that the
rising exponential envelope leads to higher excitation probability using lower photon
number in a pulse. The atomic transition saturates for ≈ 100 photons in a pulse.
Rabi oscillations with 100 MHz frequency are visible in detected fluorescence for
excitations powers of ≈ 1300 photons in a 15 ns pulse. A possibility to excite the
atom with pulses in a Fock states is discussed and the theoretical treatment is
presented.

- [1] Yimin Wang et al., Phys. Rev. A. **83** 063842 (2011)
- [2] M. Stobinska et al., EPL **86** 14007 (2009)
- [3] I. Gerhardt et al., Phys. Rev. A **79** 011402(R) (2009)

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