Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Absorption spectrum of a pulse-driven quantum emitter HERBERT F FOTSO, University at Albany SUNY, VIATCHESLAV DOBROVITSKI, Delft University of Technology — Spectral diffusion, the process by which the emission of a quantum emitter uncontrollably drifts in time, is a major hurdle for implementing a scalable quantum network with solid-state qubits [1]. Recently, it has been demonstrated that this problem can be remedied with a periodic sequence of optical pulses, which can maintain the bulk of the emission at a set target frequency thus improving photon indistinguishability [2]. Extending this approach to the absorption-based schemes for long-range entanglement which attracted much interest lately [3], we study the absorption spectrum of a quantum emitter driven by such a periodic sequence of optical pulses with a finite detuning with respect to the emitter. We find that, for moderate values of the sequence period and of the detuning, the absorption spectrum has a lineshape with little dependence on the detuning. It features a pronounced peak of stimulated emission at the pulse frequency and equidistant satellite peaks with weights strongly suppressed away from the central peak. We describe the solution and the evolution of this absorption spectrum as a function time. [1] K.-M. Fu et al, PRL 103, 256404 (2009). [2] H. F. Fotso et al, PRL 116, 033603 (2016). [3] S. Yang et al., Nat. Photonics 10, 507 (2016).

Herbert F Fotso
University at Albany SUNY

Date submitted: 10 Nov 2016 Electronic form version 1.4