Abstract Submitted
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**Multipulse dynamical decoupling-like protocol for controlling the light emission line of a two-level system**[1] HERBERT F. FOTSO, Ames Laboratory, ADRIAN FEIGUIN, Northeastern University, VIATCHESLAV DOBROVITSKI, Ames Laboratory — Emission lines of quantum systems in solids, such as quantum dots or color centers, are often significantly affected by the coupling to the solid-state environment, so that the frequency of the emitted light slowly but uncontrollably fluctuates over time [1,2]. These fluctuations impede the photon-based quantum information processing schemes (e.g. the two-photon interference, where the frequencies of the photons should stay close), and impair the protocols using the stationary-to-flying qubit conversion. We present a possible solution for this problem, which employs optical pulses applied to the emitting system, which stabilize the position of the emission line at the desired location. Modeling the emitter as a two-level system, we analyze performance of the scheme both analytically and numerically. We show that already a few pulses, with rather large inter-pulse delay, can stabilize the emission line. We discuss application of the proposed scheme for stabilization of the zero-phonon emission line of the NV centers in diamond, and the possible use of this scheme for facilitating the long-distance entanglement between the NV centers [3]. [1] K.-M. Fu et al, PRL 103, 256404 (2009). [2] V. M. Acosta et al, PRL 108, 206401 (2012). [3] W. Pfaff et al, Science 345 6196, 532 (2014).

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