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C'est trop bien

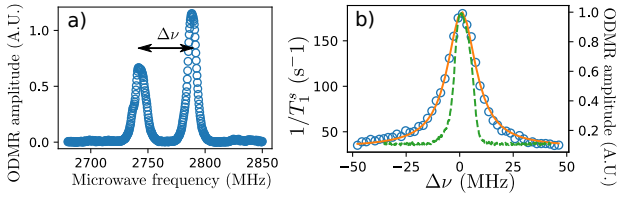

FIG. 1. Modification of the stretch lifetime for two near-resonant classes. (a) ODMR spectrum with amplitude modulation of the microwave for the $|0\rangle \rightarrow |-1\rangle$ transition of two separate NV classes. The frequency detuning between the two transitions is denoted $\Delta\nu$. (b) Stretch part of the lifetime decay for one of the two classes as function of the frequency detuning (blue circles), fitted by a Lorentzian with half width at half maximum 8.04 MHz . Green dashed line correspond to the ODMR width of a single class stretched by a factor $\sqrt{2}$, approximating the overlap of the two classes (see SI).

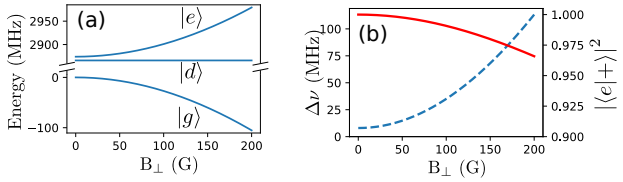

FIG. 2. Simulated eigenstates of the spin Hamiltonian in the presence of purely transverse magnetic field. (a) Energies of the three eigenstates $|g\rangle$, $|d\rangle$ and $|e\rangle$ as a function of the magnetic field amplitude. (b) Blue dashed curve : frequency detuning between the two transitions $|g\rangle \leftrightarrow |d\rangle$ and $|g\rangle \leftrightarrow |e\rangle$. Plain red curve : projection of $|e\rangle$ on $|+\rangle = (|+1\rangle + |-1\rangle)/\sqrt{2}$ as a function the magnetic field. Is equal to the projection of $|g\rangle$ on $|0\rangle$.

ACKNOWLEDGEMENTS

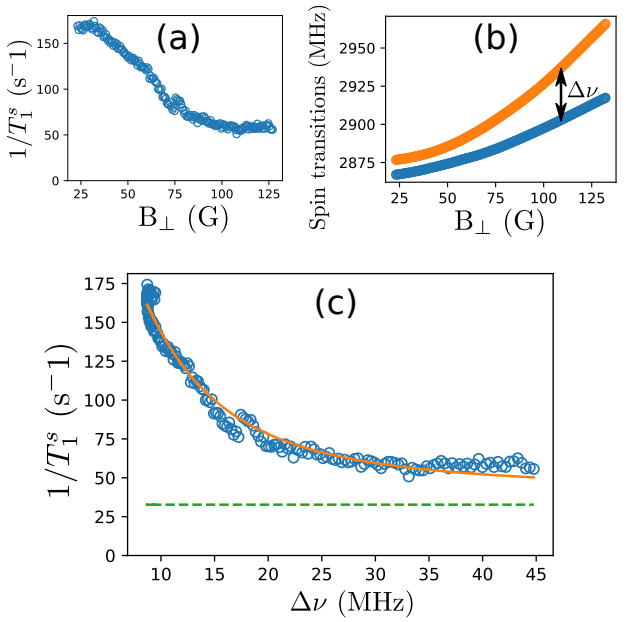

FIG. 3. Modification of the stretch lifetime in the presence of purely transverse magnetic field. (a) Stretch component of the ensemble lifetime as a function of the field amplitude. (b) Measured transition frequencies through ODMR spectrum. (c) Stretch component of the lifetime as a function of the frequency detuning between the two transistions (blue circles), fitted by a Lorentzian centered in $\Delta\nu = 0$ with half width at half maximum 8MHz. The green dashed line correspond to the lifetime of a single class aligned with the magnetic field.