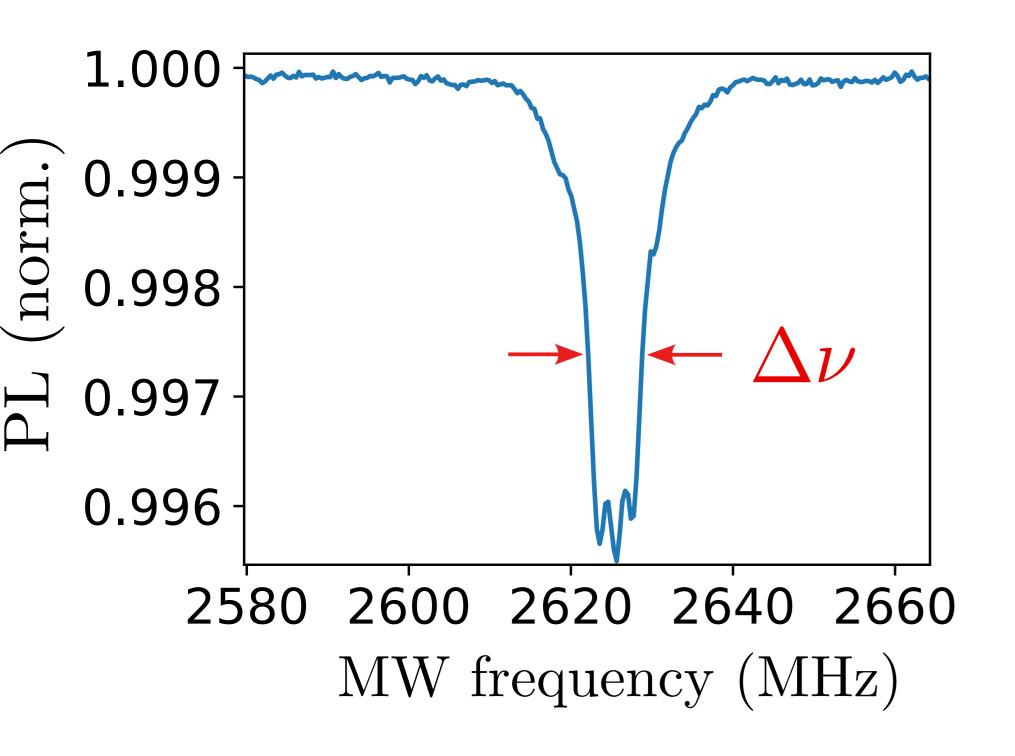
Ideal (DC) sensitivity for N independent NV centers:

$$\eta [\mathrm{T/\sqrt{Hz}}] pprox \frac{\hbar \sqrt{\Delta \nu}}{\mathrm{g}\mu_{\mathrm{B}} \mathrm{C}\sqrt{\mathrm{N}}}$$



- \hbar : Planck constant
- μ_B : Bohr magneton
- \bullet g : NV electron Landé factor
- \bullet C: Spin readout contrast
- } Experimental parameters

Sample parameters

Constants

- \bullet N: Number of NV centers
- $\Delta \nu = \frac{1}{T_2^*}$: Spectral linewidth

 $1~\mu \mathrm{m}~\mathrm{diamond}$ $N = 10^6 (10 \text{ ppm})$ N = 1 $\rightarrow \eta \approx 10 \text{ pT/}\sqrt{\text{Hz}}$ $\eta \approx 10 \text{ nT}/\sqrt{\text{Hz}}$