

color in diamond is due to defects

NV⁻ color center:

nitrogen with adjacent vacancy
negatively charged

C_{3v} symmetry

symmetries: $\{E, C_3, C_3^2, R_1, R_2, R_3\}$

C₃: rotation by $\frac{2\pi}{3}$ about the NV axis

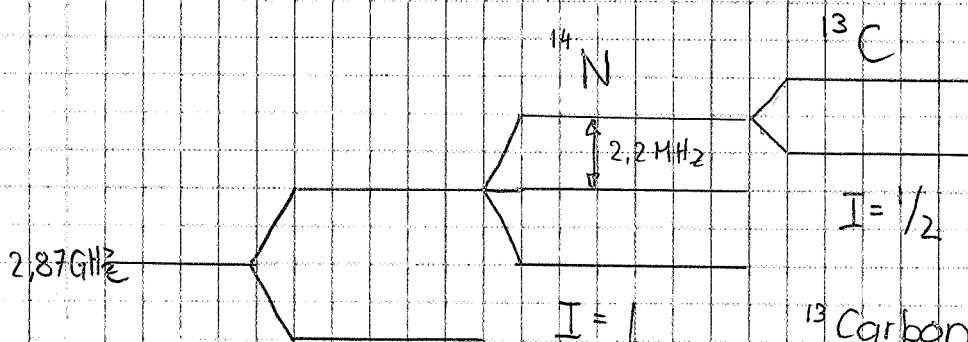
R_i: mirror reflection about the plane containing the NV axis and any neighbouring carbon atom

optical transition

637nm, 1.95eV, 470THz, 22'600K

microwave

105mm, 12μeV, 2.87GHz, 40mK



Zeeman splitting
 2.8 MHz/Gauss

^{13}C sitting in the vicinity of the NV
coupling strength 130 MHz
if ^{13}C sits right next to vacancy

Comparison

NV	Quantum Circuits
+ long coherence 1,2msec ¹³ C: larger 1sec	- short coherence 20µsec
- weak coupling	+ strong coupling
- fixed properties	+ engineered properties
+ simplicity	- complicated structure
+ room temperature	- dilution fridge (10mK)