

For an spin qubit at a distance  $d = 20$  nm from a metal surface of conductivity  $\sigma = 1.7 \times 10^{17}/s$  and operating frequency  $\omega_0 = 1.3 \times 10^{11}/s$  we get a  $T_1^{-1}$  of

$$\begin{aligned}\frac{1}{T_1} &= \frac{\pi \mu_B^2 \sigma \omega_0}{2 \hbar d c^2} = \frac{3.14 \times (9.27 \times 10^{-21} \text{ergs/gauss})^2 \times (1.7 \times 10^{17}/s) \times (1.3 \times 10^{11}/s)}{2 \times (1.05 \times 10^{-27} \text{erg} - s) \times (2 \times 10^{-6} \text{cm}) \times (3 \times 10^{10} \text{cm/s})^2} \\ &= 1.6/s.\end{aligned}$$

which differs from the previous result only in the distance  $d$  being now 20 nm rather than 8 nm as before. All the constants are in cgs units. The only one that might require a check is

$$\sigma = 1.7 \times 10^{17}/s$$

which in SI is

$$\begin{aligned}\sigma_{SI} \left( \frac{S}{m} \right) &= 4\pi \varepsilon_0 \sigma_{cgs} \left( \frac{1}{s} \right) \\ &= 4 \times 3.14 \times 8.85 \times 10^{-12} \times 1.7 \times 10^{17} S/m \\ &= 1.9 \times 10^7 S/m.\end{aligned}$$

I do not remember exactly where I got this number - possibly from notes I made from a conversation with Andrea.