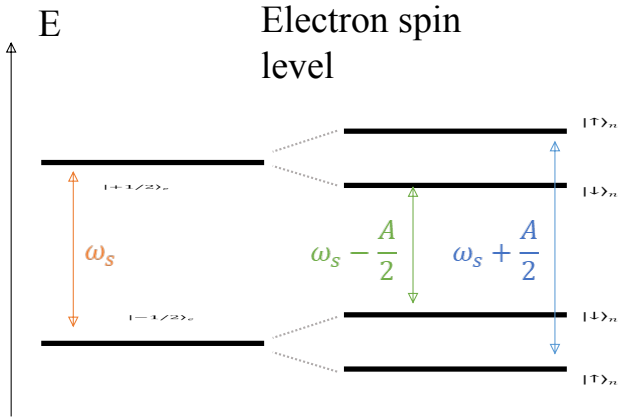
Réunion de travail #1
LJAD – ICB

21 / 02 / 2025

Système

$$\mathrm{H}_{DR} = AS_zI_z + u_0[\cos(\varphi_S)S_x + \sin(\varphi_S)\,S_y]$$

- D. rotating (@ ω_s, ω_I)
- mw only ($v(t)$=0)
- Regular solution ($|u| = u_o$)
  - $u(t) = u_0\cos(\omega_s t + \varphi_S)$
- $U = \exp(-\omega_S t S_z)\,, U^{+}S_x U$
- Rotating wave approximation !

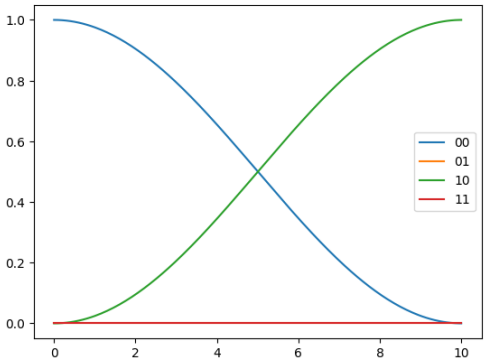


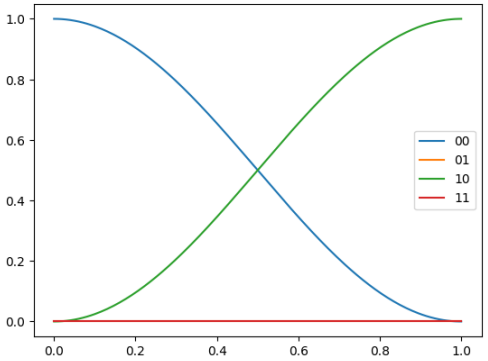
Obj 1 : control rotation

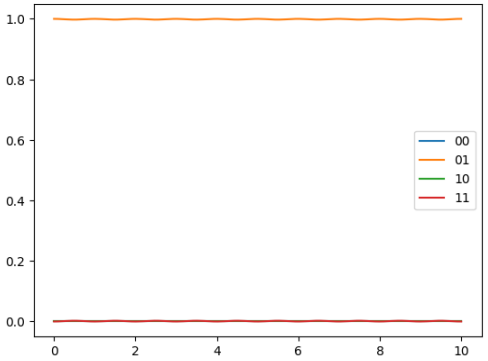
- Rotation of electron spin iff nuclear spin $|\uparrow\rangle_n$

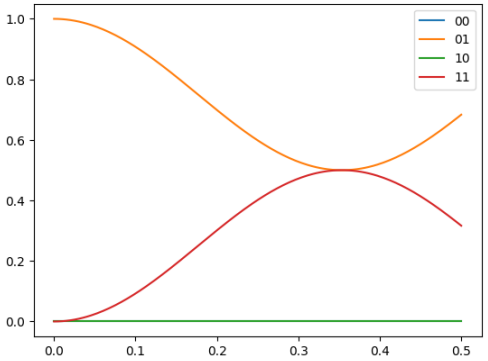
« Classsical » pulse :

- $\varphi_S = \frac{A}{2}t$, i.e : drive at pulsation $\omega_S + \frac{A}{2}$
- θ-pulse obtain with $\tau = \frac{\theta}{2\pi}\cdot\frac{1}{u_0}$
- $\mathrm{R}_n(\theta) = \exp(i\theta\boldsymbol{n}.\boldsymbol{S})\,, R_x(\theta) = \exp(i\theta S_x)$
- $R_x(\theta)\,|0> = \cos(\theta)|0> + \sin(\theta)|1>$

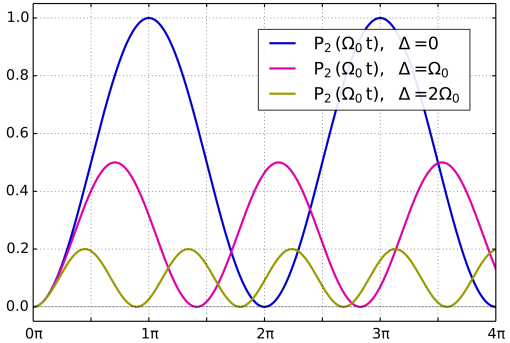






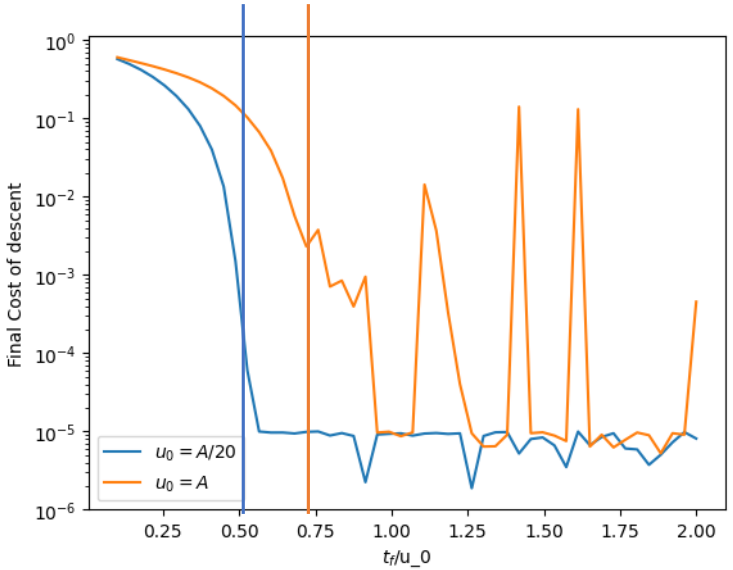


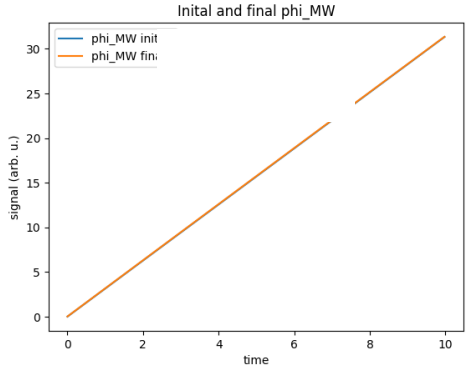
Due to off resonance driving

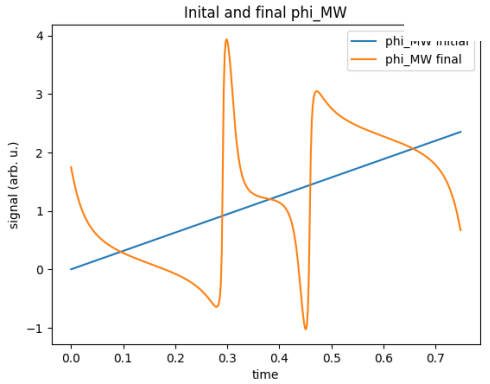


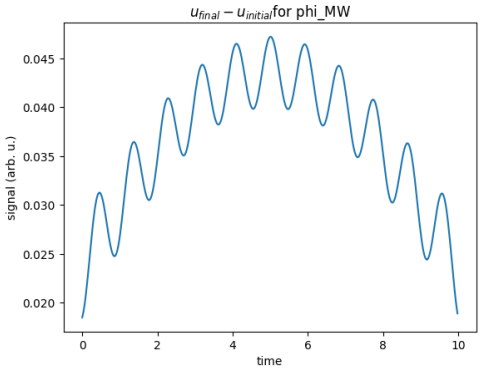
@wikipedia – Rabi Cycle

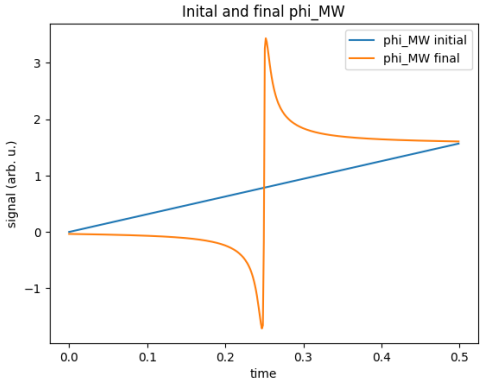
Grape to optimize the operation











Grape to optimize the operation