

$$|\rho(\{\hat{p}, \hat{f}\}_{m+1})\rangle \approx \int_{t_m}^{\infty} dt \left[ \underbrace{\mathcal{H}_C(t)}_{\text{red}} + \overbrace{\mathcal{H}_S(t)}^{\text{red}} \right] |\rho(\{p, f\}_m)\rangle$$