

Quantumdynamics, Dissipation, Control

Lecture component:

- from **experimentalists for experimentalists**;
- **basic concepts** and formulation for **practical use**,
- i.e. demonstration with small program

1. **Harmonic Oscillator in the Bloch limit:**

impulsive excitation,
difference between wavefunction and density evolution,
dipole correlation function,
representation of Hamiltonian as Liouville operator.

2. **IVR in the Harmonic Oscillator**

extension to Redfield relaxation tensor,
mechanisms for IVR
population relaxation and dephasing.
Brownian oscillator vs colored noise.

3. **Control: General Concept and application to Harmonic Oscillator**

4. **Electron transfer between two coupled diabatic electronic states**

Vibronic Hamiltonian,
wavefunction evolution after impulsive excitation,
IVR and electron transfer

5. **Control for two coupled diabatic electronic states**

6. **Coupling between a high-frequency and a low-frequency mode**

different coupling mechanisms
evolution of the system after impulsive excitation

7. **Lineshape Theory**

Brownian Oscillator model
Kubo model
Connections between BO and Kubo model.

8. **Control of coupled Harmonic Oscillators**
