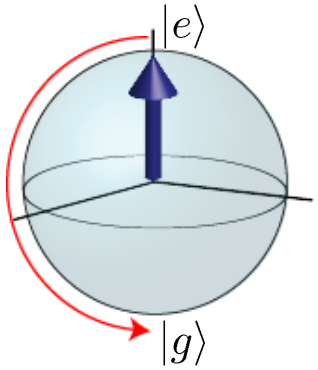
Relaxation and dephasing (T_1 and T_2)

- T_1: energy relaxation time, longitudinal homogeneous lifetime (NMR)

depolarization, decay, population relaxation

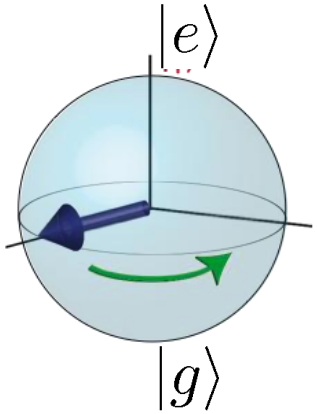


perturbation orthogonal to quantization axis ($\propto s_{x,y}$) leading to decay

e.g. spontaneous emission, inelastic collisions

- T_2: dephasing time, transverse homogeneous lifetime (NMR)

dephasing, decoherence, phase relaxation



slow perturbation **along quantization axis** ($\propto s_z$) leading to fluctuations in the energy levels

e.g. elastic collisions