Table of contents

Probability:

$$P = \frac{\mathcal{J}}{N \cdot h\nu} dAdt = |\Psi|^2 = \Psi^* \Psi \overset{interference, pathindependent}{=} \left|\sum \Psi_i\right|^2 \overset{nointerference, pathdependent}{=} \sum |\Psi_i|^2 \tag{1}$$

where: $\mathcal{J} \equiv$ Intensitiy $N \equiv$ particles $A \equiv$ area of incidence orthogonal to movement

Absorbtion Probability:

$$\frac{P}{t} := W_{mn} = B_{mn} \cdot \frac{N(\nu)}{V} \cdot h\nu = B_{mn} \cdot w_\nu(\nu) = B_{mn} \cdot \frac{d}{d\nu} w_{EM} \tag{2}$$

Stimulated Emission Probability:

$$\frac{P}{t} =: W_{nm} = B_{nm} \cdot \frac{N(\nu)}{V} \cdot h\nu = B_{nm} \cdot w_\nu(\nu) = B_{nm} \cdot \frac{d}{d\nu} w_{EM} \tag{3}$$

Spontaneous Emission Probability:

$$\frac{P}{t} =: W_{nm} = A_{nm} = \frac{1}{\bar{\tau}} \tag{4}$$

where: $n \equiv$ exited state $m \equiv$ ground state $N \equiv$ particles amount $V \equiv$ Volume $\bar{\tau} \equiv$ mean livetime of state for spontaneous emission $B, A \equiv$ Einsteincoefficients