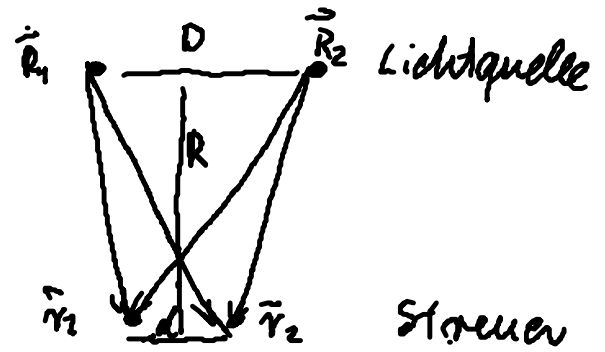
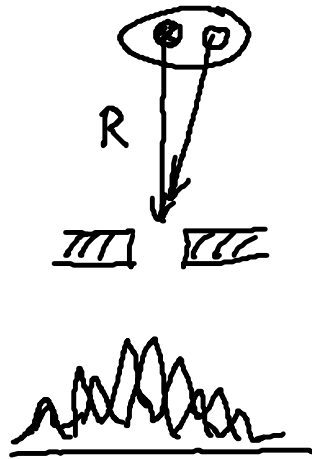
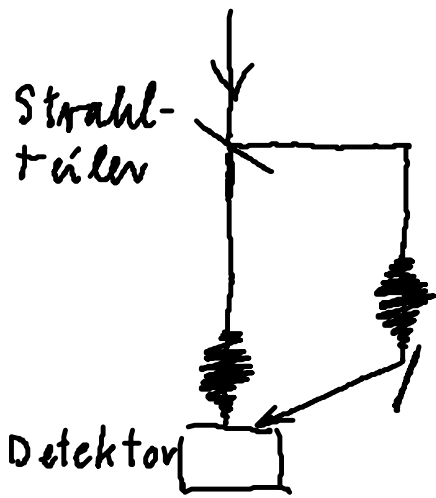


7.4 Kohärente Zustände

Zeitliche Kohärenz

räumliche Kohärenz



$$\Delta_1 = |R_1 - \vec{r}_1| - |R_1 - \vec{r}_2|$$

$$\Delta_2 = |R_2 - \vec{r}_1| - |R_2 - \vec{r}_2|$$

Bedingung für räuml. Kohärenz

$$|\Delta_1 - \Delta_2| < \lambda$$

$$\Rightarrow \frac{Dd}{R} < \lambda \quad ; \quad \frac{D}{R} = \alpha$$

$d < \frac{\lambda}{\alpha}$

$$|\alpha\rangle : c|\alpha\rangle = \alpha|\alpha\rangle \text{ mit } \alpha \in \mathbb{C}$$

$$\text{mit } \langle \alpha | \alpha \rangle = 1, \quad |\alpha\rangle = \sum_{n=0}^{\infty} |n\rangle \langle n | \alpha \rangle$$

$$\Rightarrow \langle \alpha | c | \alpha \rangle = \alpha \quad \Rightarrow \langle \alpha | c^\dagger | \alpha \rangle = \langle c \alpha | \alpha \rangle = \alpha^* \langle \alpha | \alpha \rangle = \alpha^*$$

$$\vec{E} = \frac{\vec{e}}{\sqrt{2}} \sqrt{\frac{\hbar \omega}{\epsilon V}} \vec{u} \left[\exp\{i(\vec{q} \cdot \vec{r} - \omega t)\} c - \exp\{-i(\vec{q} \cdot \vec{r} - \omega t)\} c^\dagger \right]$$

$$\langle \alpha | \hat{E} | \alpha \rangle =$$

$$\langle \alpha | c | \alpha \rangle = \alpha$$

$$\langle \alpha | c^\dagger | \alpha \rangle = \alpha^*$$

$$\alpha = |\alpha| \exp\{i\varphi\}$$

$$\langle \alpha | \hat{E} | \alpha \rangle = \frac{i}{\sqrt{2}} \sqrt{\frac{\hbar \omega}{\epsilon V}} \vec{u} |\alpha| \left[\exp\{i(\vec{q} \cdot \vec{r} - \omega t + \varphi)\} - \exp\{-i(\vec{q} \cdot \vec{r} - \omega t + \varphi)\} \right]$$

$$= -\sqrt{2} \sqrt{\frac{\hbar \omega}{\epsilon V}} \bar{u} |\alpha| \sin \{ \bar{q} \cdot \bar{r} - \omega t + \varphi \}$$

$$\sin x = \frac{e^x - e^{-x}}{2i}$$