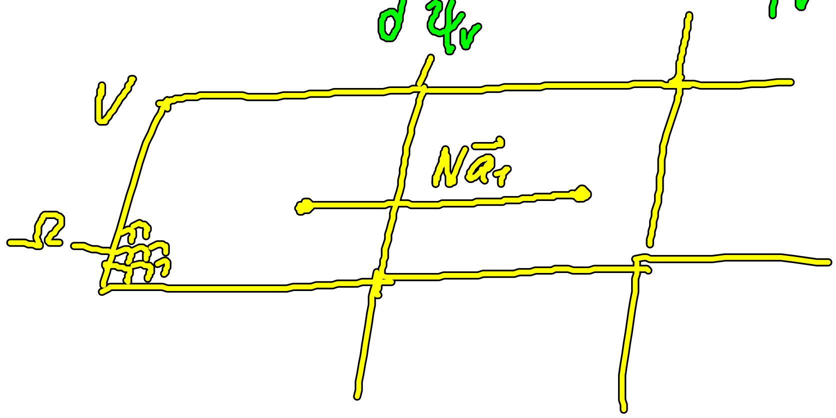
Kap. 7 Quantenoptik

klass. Mech. $W=\int_{t_0}^{t_1} L(q_k,\dot q_k,t)\,dt'$ EP $\frac{\delta W}{\delta q_k}=0$

Feldtheorie

$$W = \int_{t_0}^{t_1} L(\psi_\nu,\dot\psi_\nu,\psi_{\nu|k})\,dt \quad \text{mit} \quad L=\int \mathcal{L}(\psi_\nu,\dot\psi_\nu,\psi_{\nu|k})\,d^3r$$

$$W=\int_{t_0}^{t_1} dt \int d^3r\,\mathcal{L} \to \frac{\delta W}{\delta\psi_\nu}=0, \quad \psi_\nu=\psi_\nu(\vec r,t)$$



$\mathcal{H}$, $\varphi_k\in\mathcal{H}$ Basis

$$\psi\in\mathcal{H}, \quad \psi=\sum_\nu \varphi_\nu\langle\varphi_\nu|\psi\rangle$$

$$\langle\varphi_\nu|\psi\rangle = \int \varphi_\nu^*(x)\,\psi(x)\,d\tau$$

$$\psi(x)=\int \underbrace{\sum_\nu \varphi_\nu(x)\,\varphi_\nu^*(x')}_{\delta(x-x')}\psi(x')\,d\tau'$$

$$\varphi_\nu(x)\to\frac{1}{\sqrt V}\exp\{i\vec q\cdot\vec r\}$$