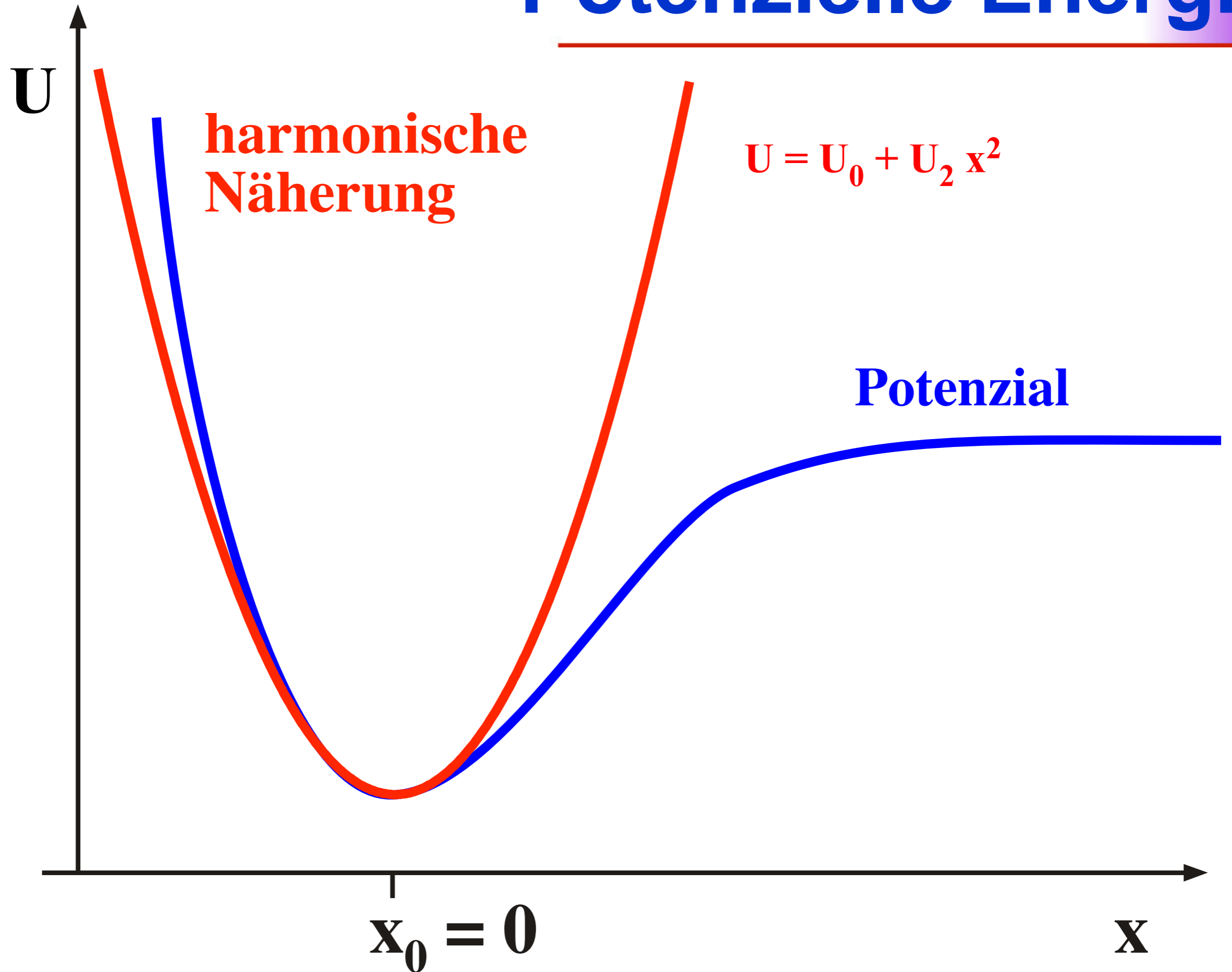
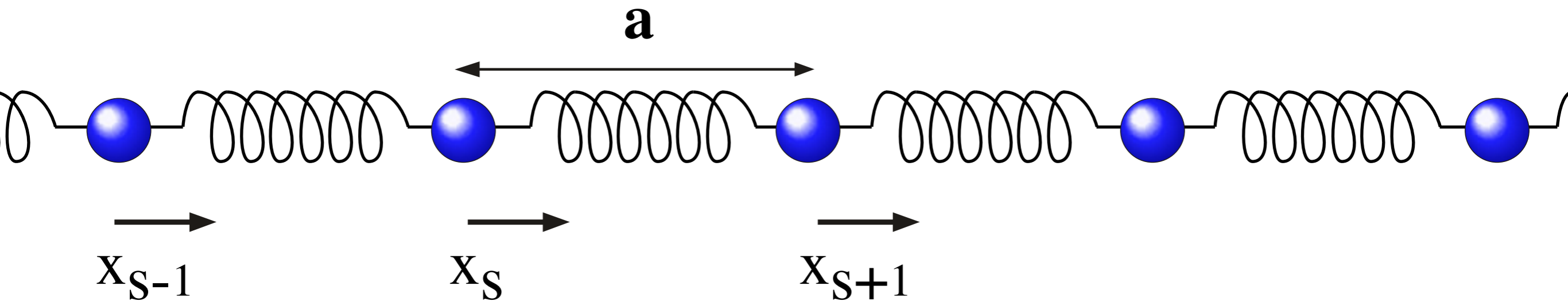


Potenzielle Energie





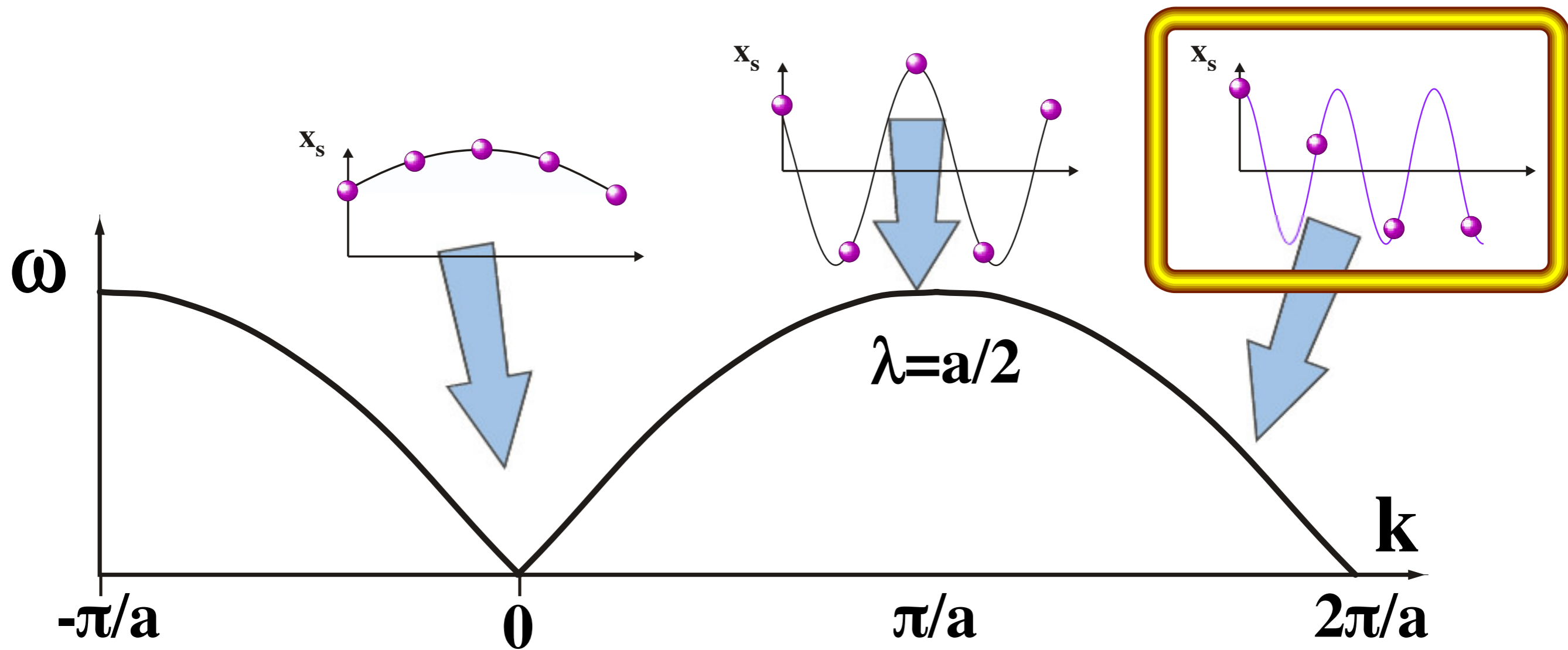
Bewegungsgleichung:

$$\mathbf{M} \ddot{\mathbf{x}}_s = \mathbf{C}(\mathbf{x}_{s+1} + \mathbf{x}_{s-1} - 2 \mathbf{x}_s)$$

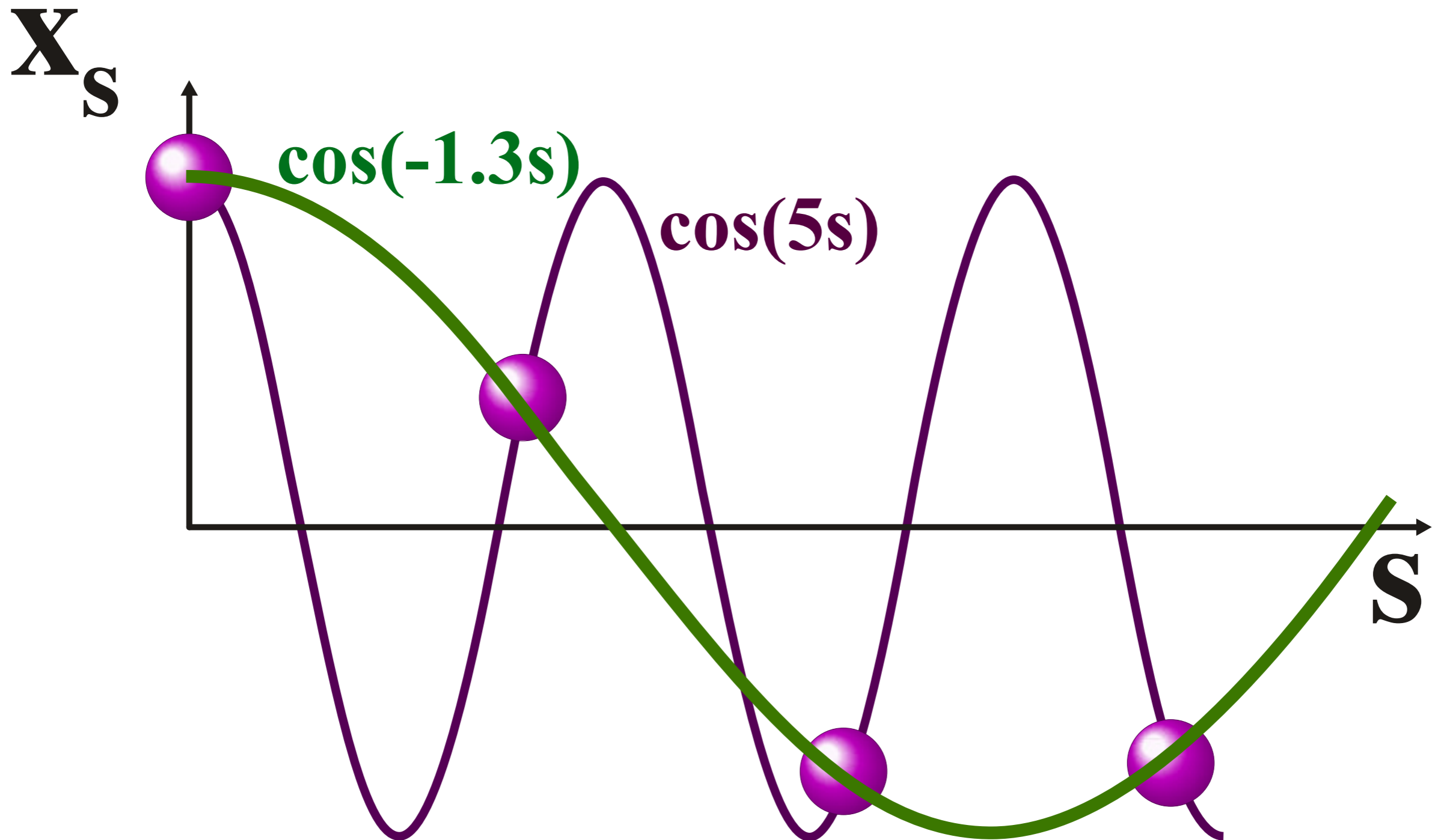
Lösungsansatz:

$$\mathbf{x}_s = \mathbf{X}_0 e^{i(ksa - \omega t)}$$

Dispersion einer 1D Kette

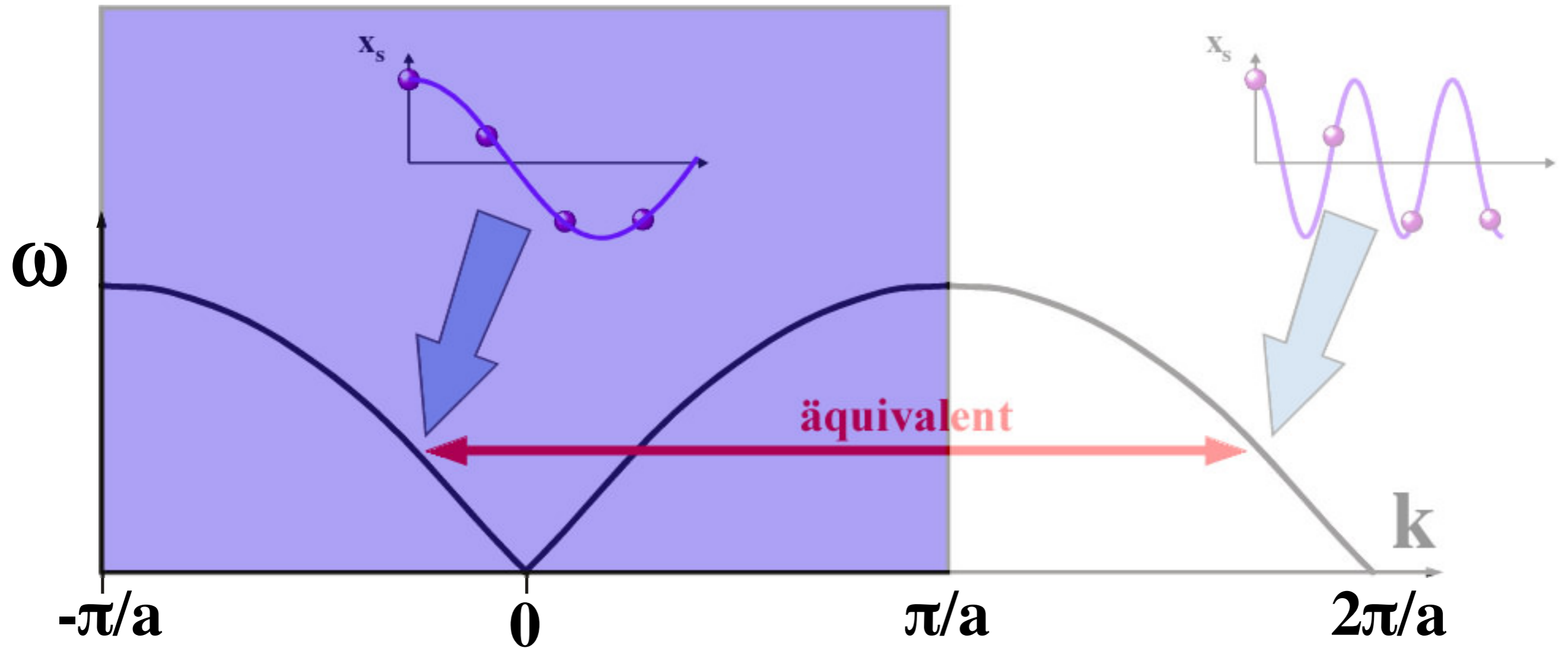


Welle im Gitter

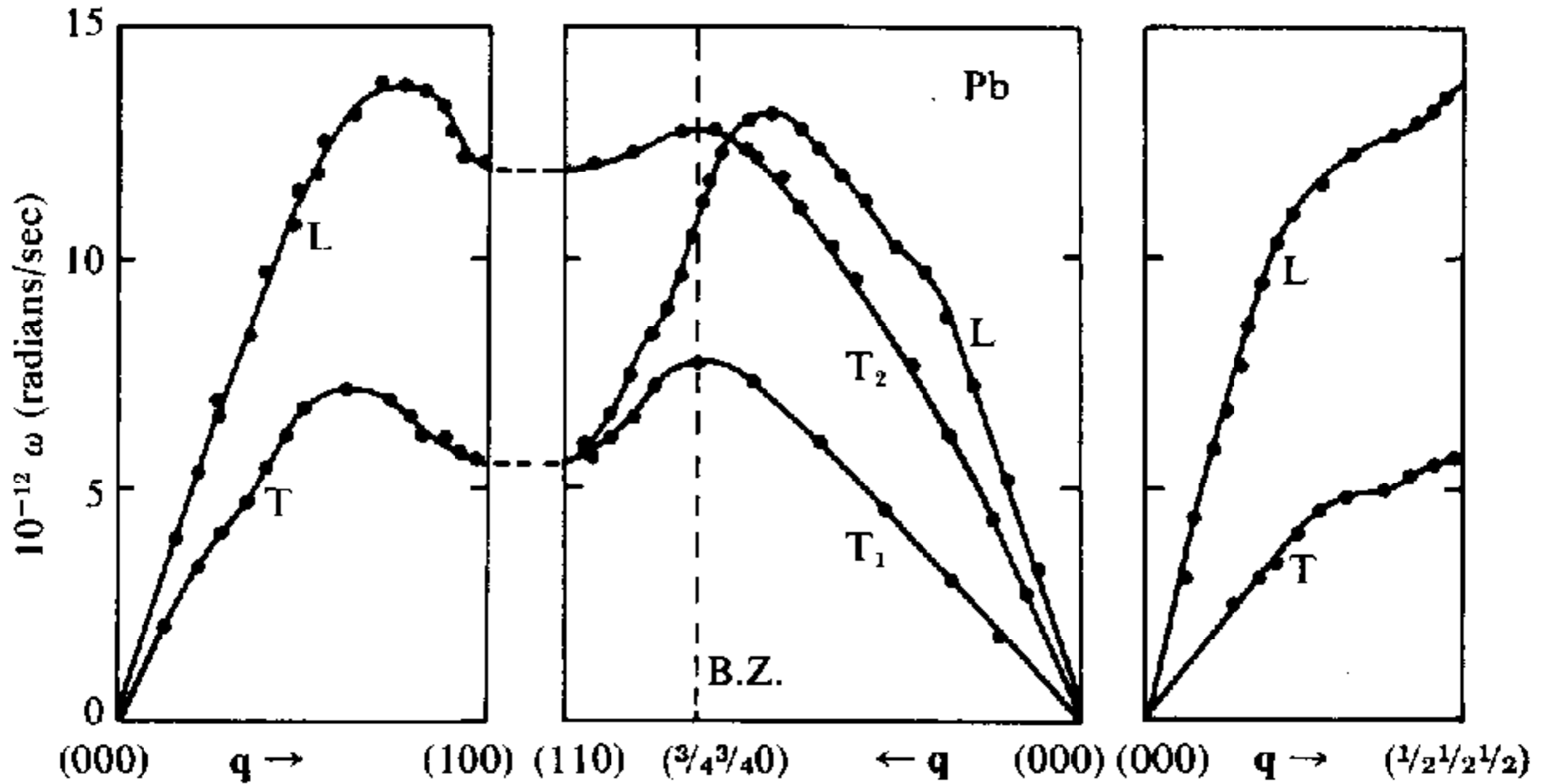


1. Brillouin Zone

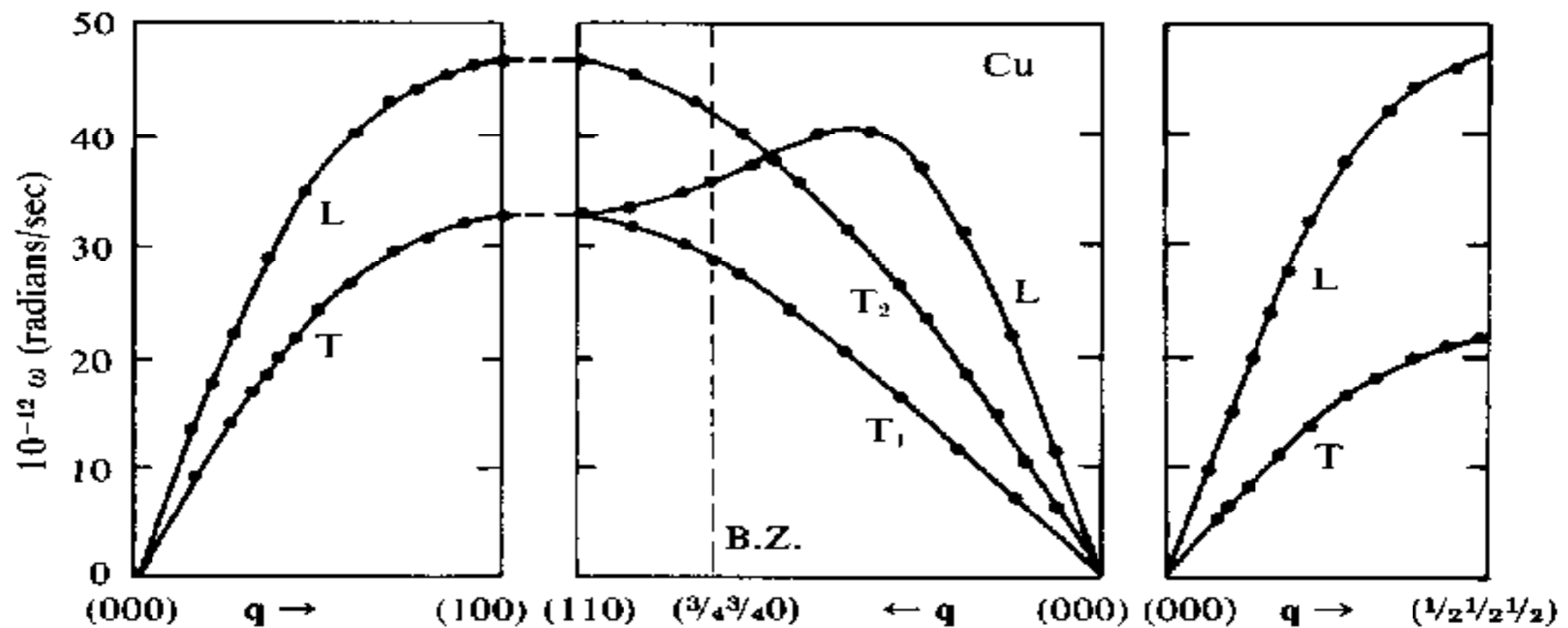
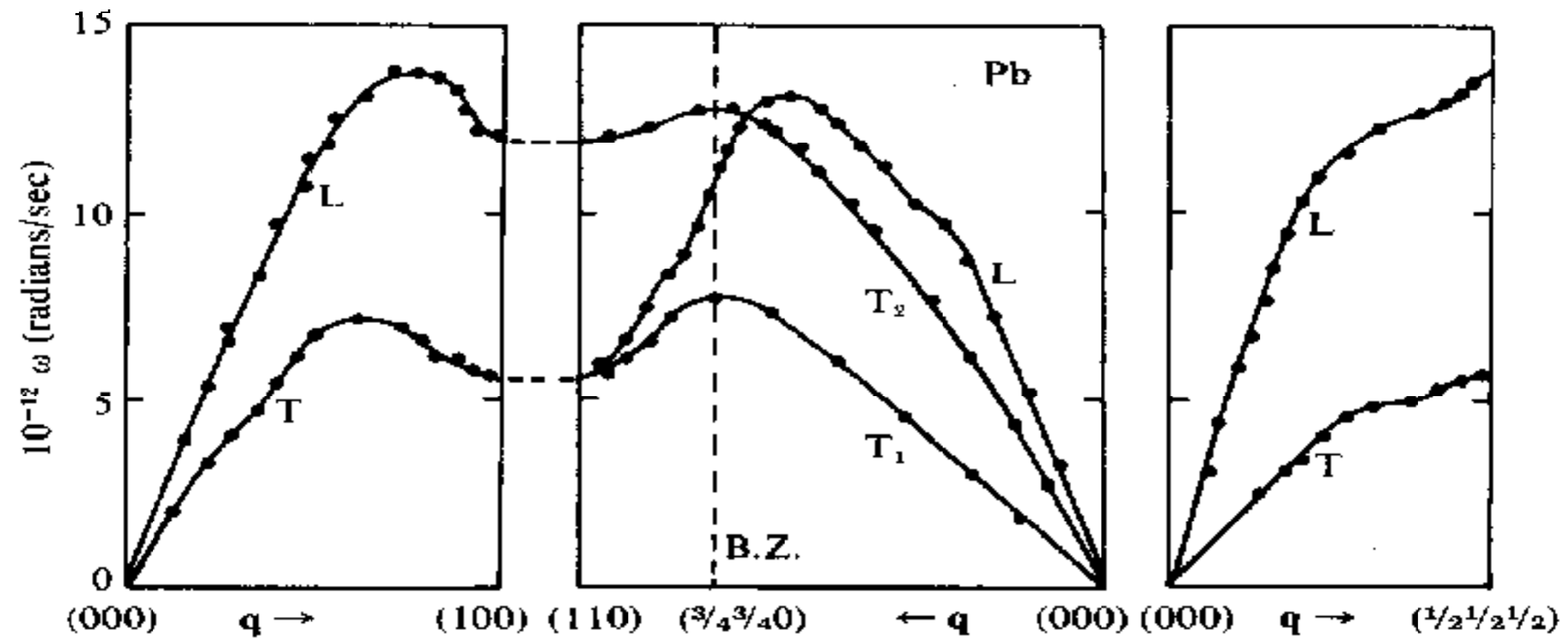
1. Brillouin-Zone
enthält gesamte Information



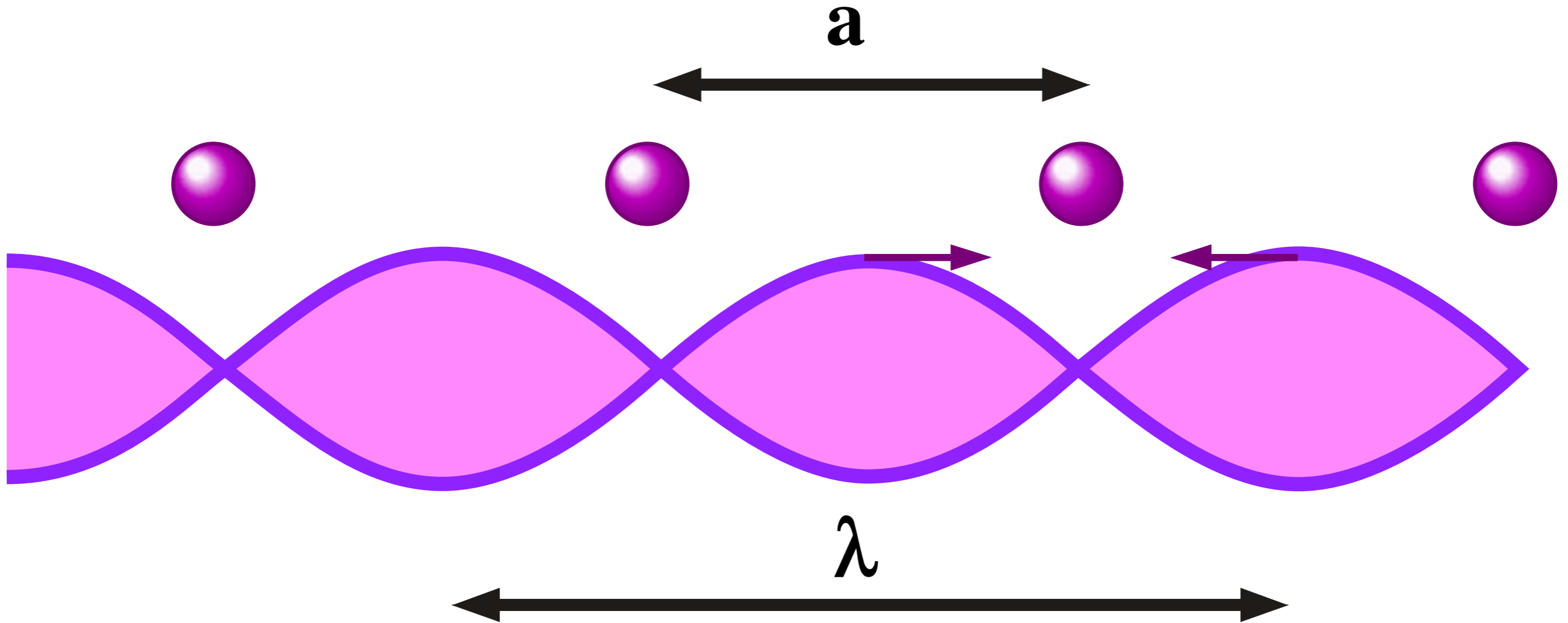
Phonon dispersion



Phononendispersion in Cu und Pb



Reflexion der Wellen



Federmodell

