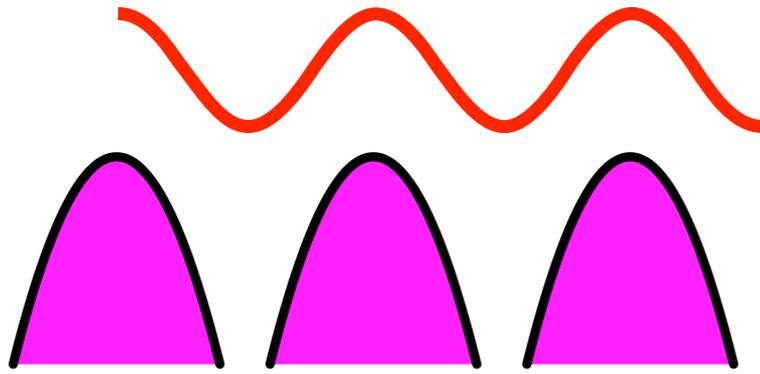
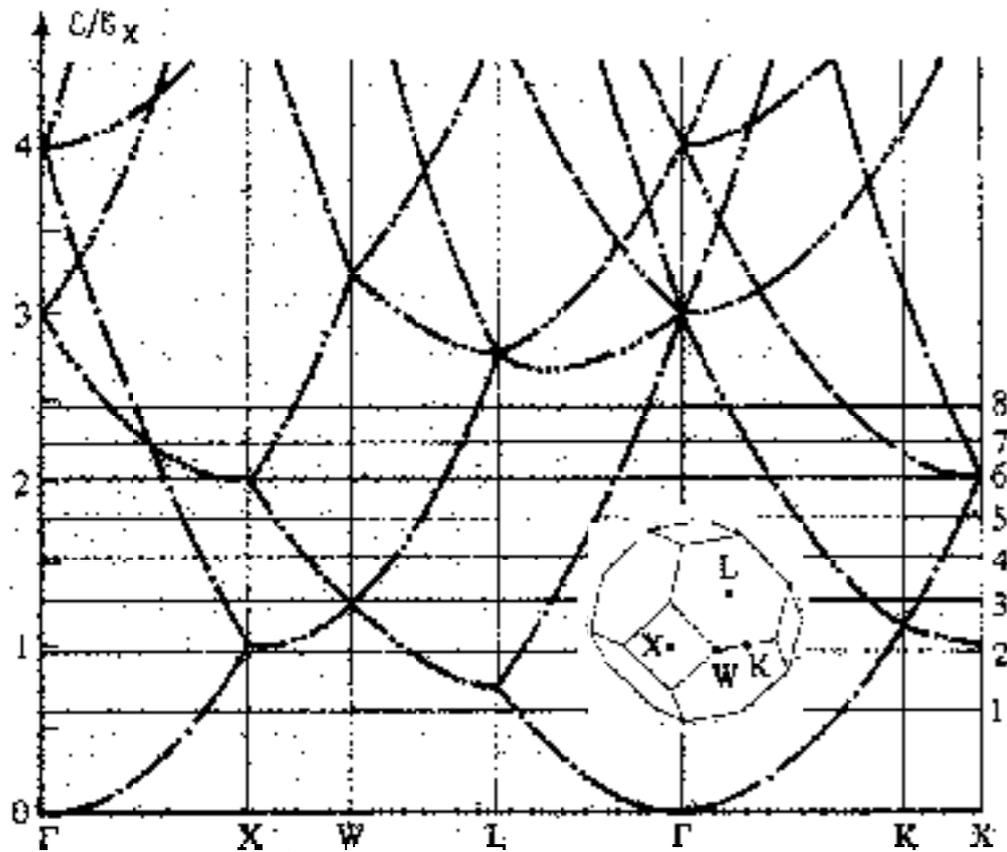


# 6) Bandstrukturen

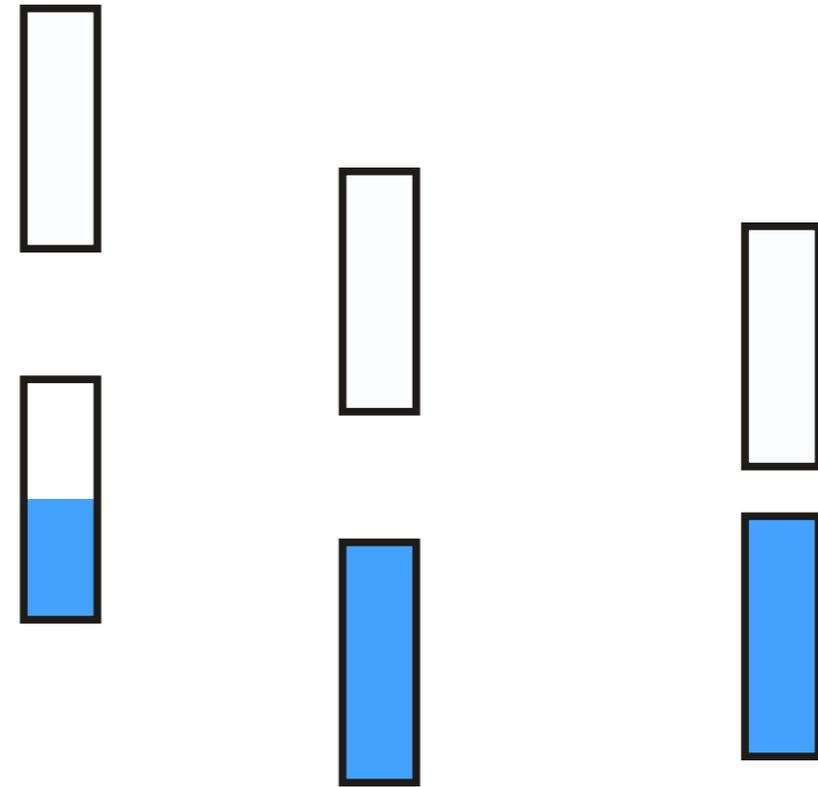
## Elektronen im periodischen Potenzial



## Bänder



## Bandstruktur und Leitfähigkeit

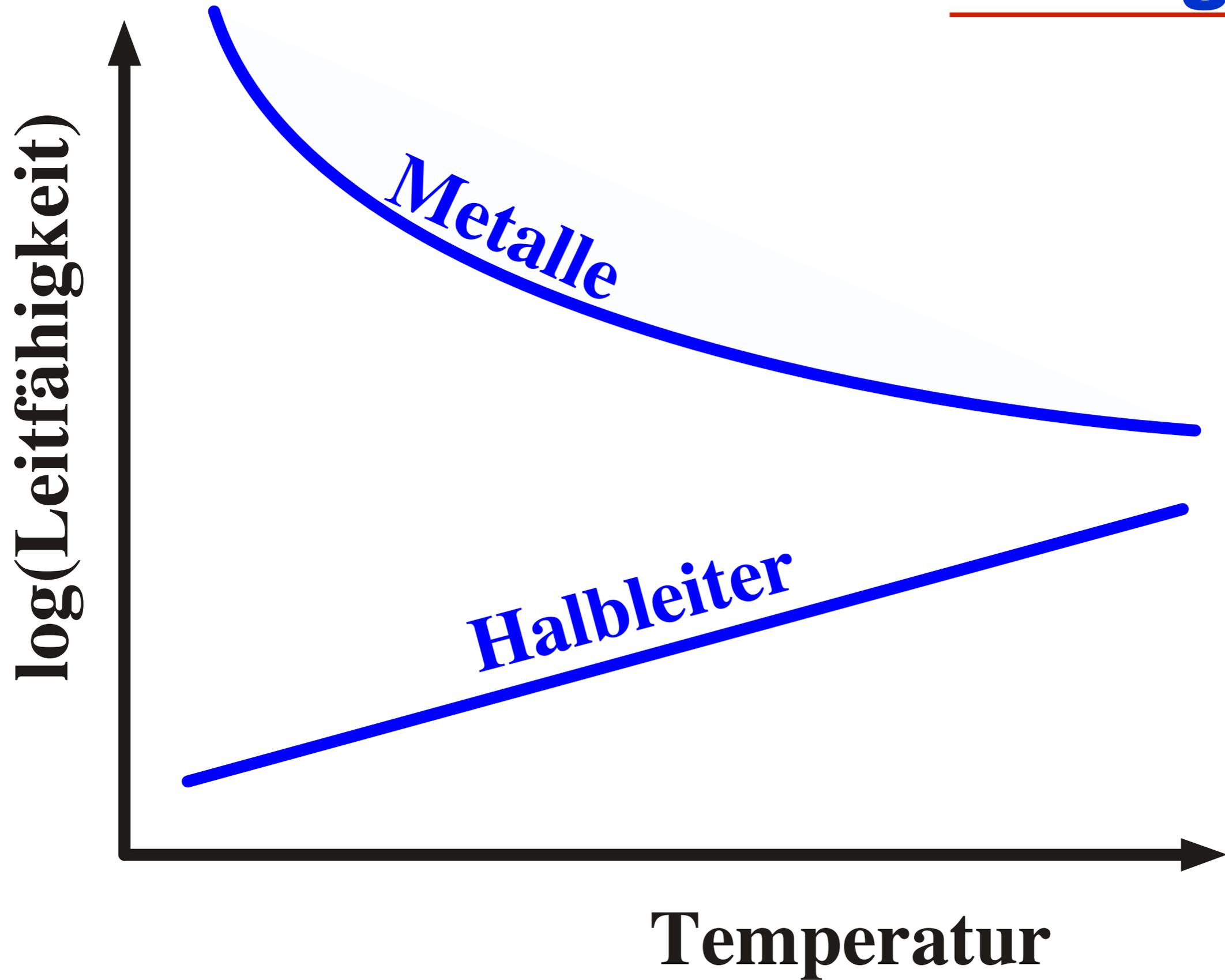


**Metall**

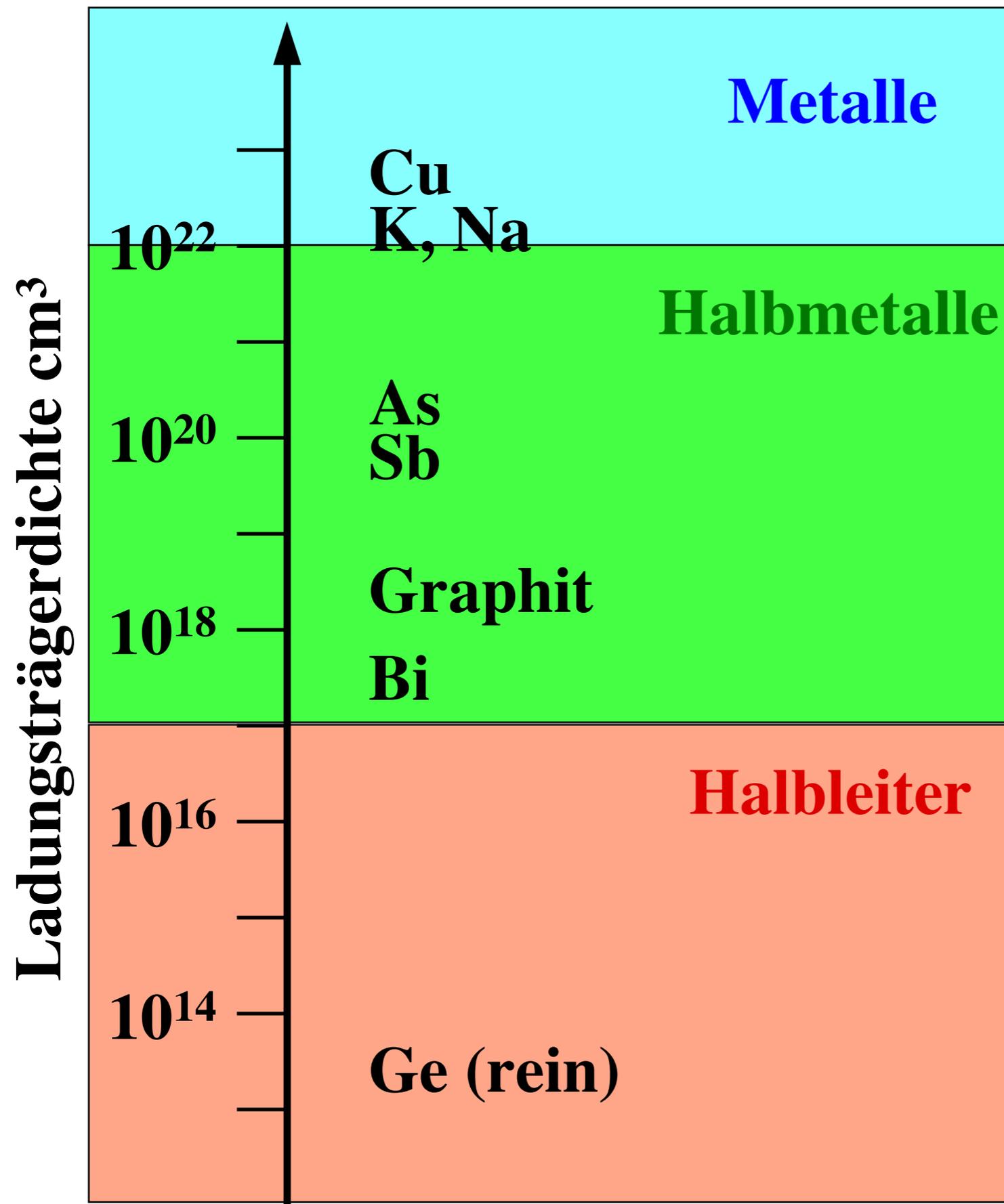
**Isolator**

**Halbleiter**

# Leitfähigkeit

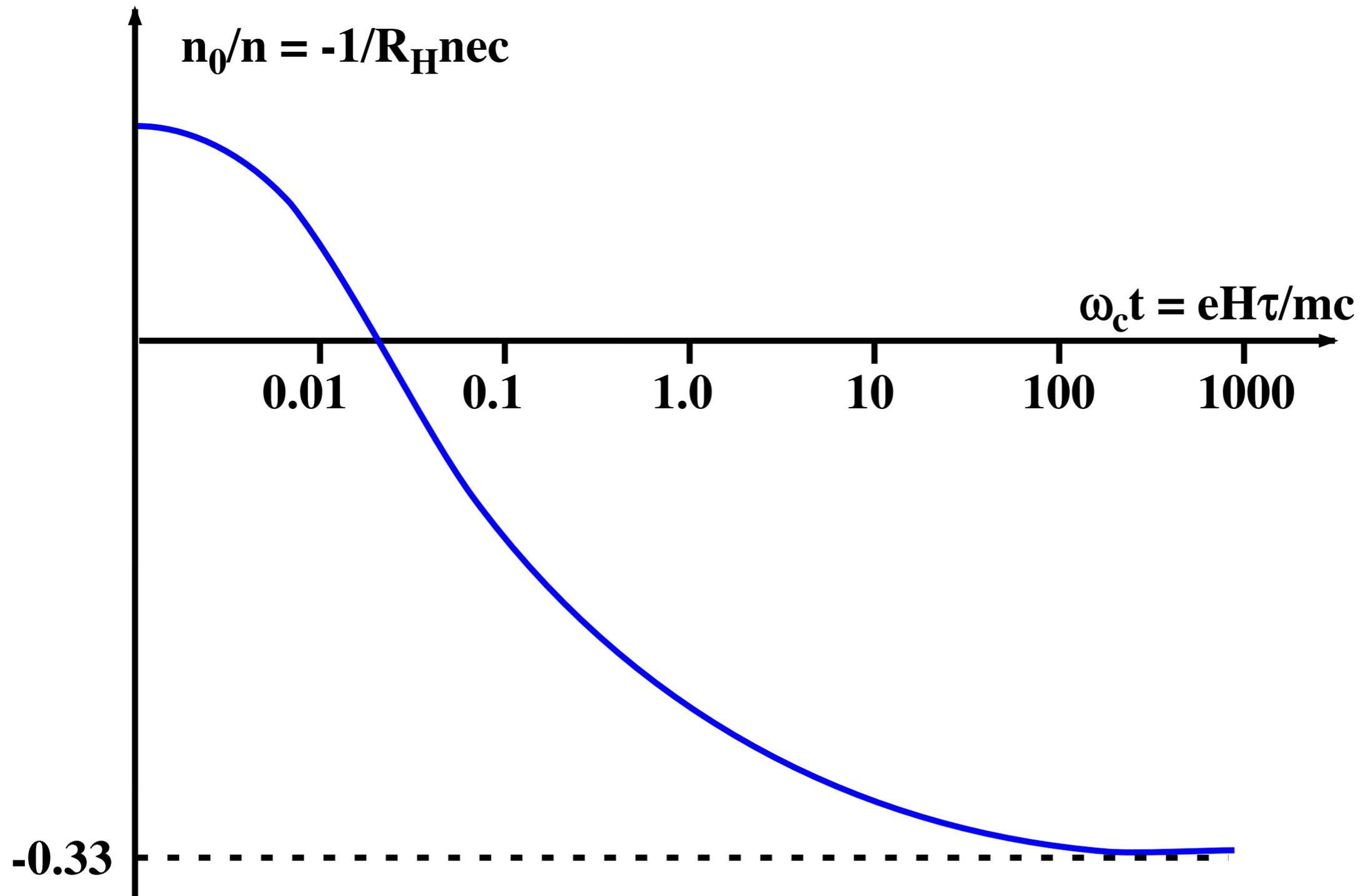


# Ladungsträgerdichte

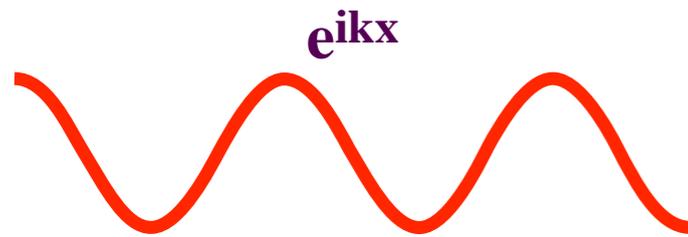


Warum sind Elektronen  
“frei” oder “gebunden”?

## Feld-abhängiger Hall Widerstand in Al

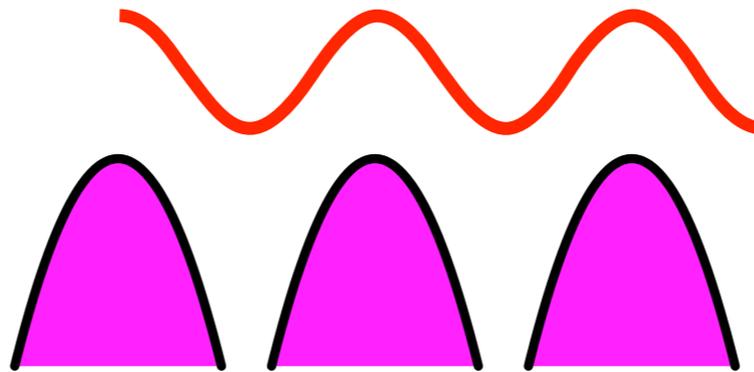


# Freie vs. lokalisierte Elektronen

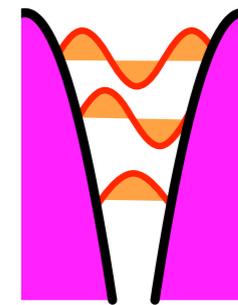


freie Elektronen

$$H = \frac{p^2}{2m}$$



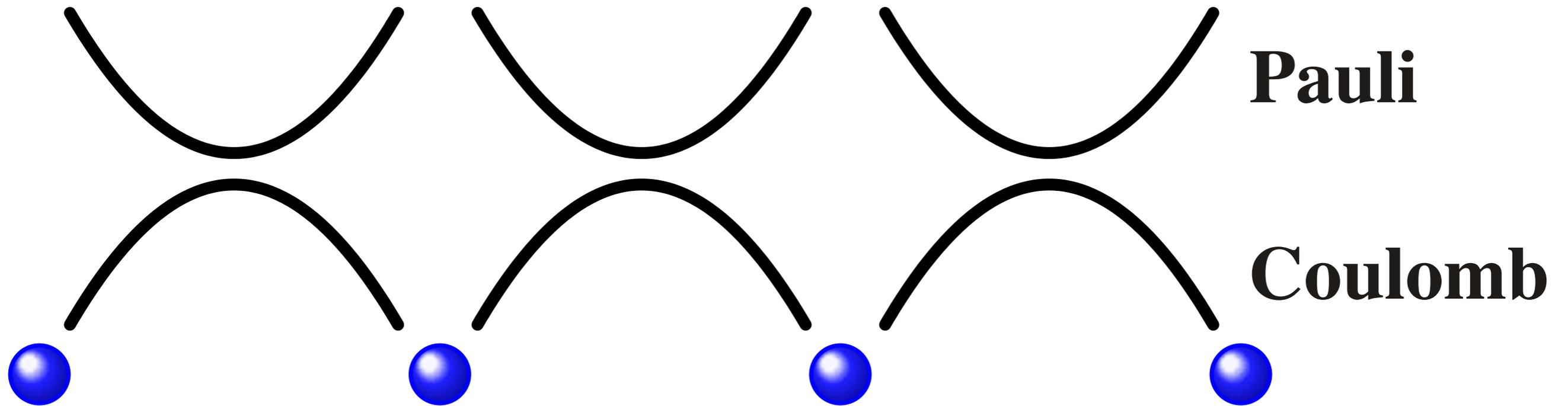
Metalle : quasi-freie Elektronen



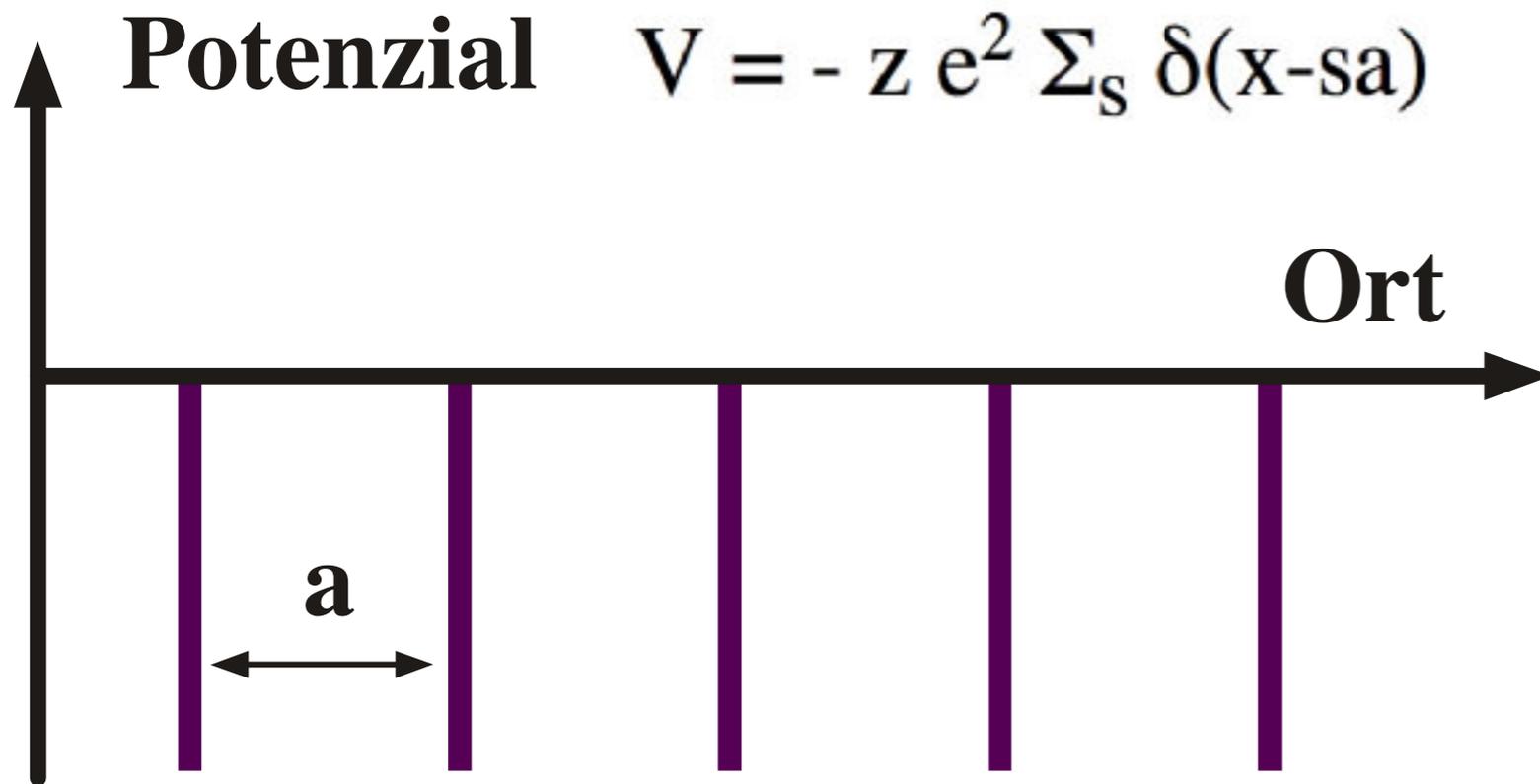
lokalisierte  
Elektronen

# Periodisches Potenzial

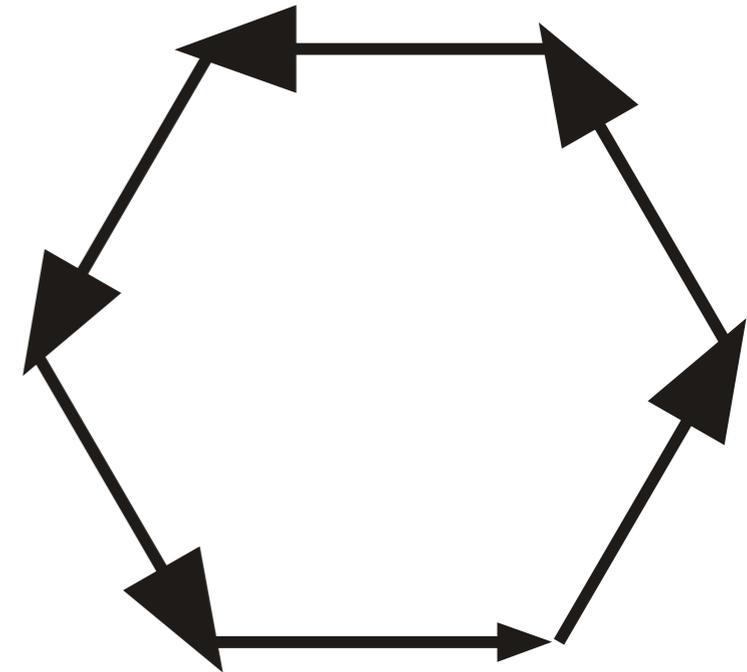
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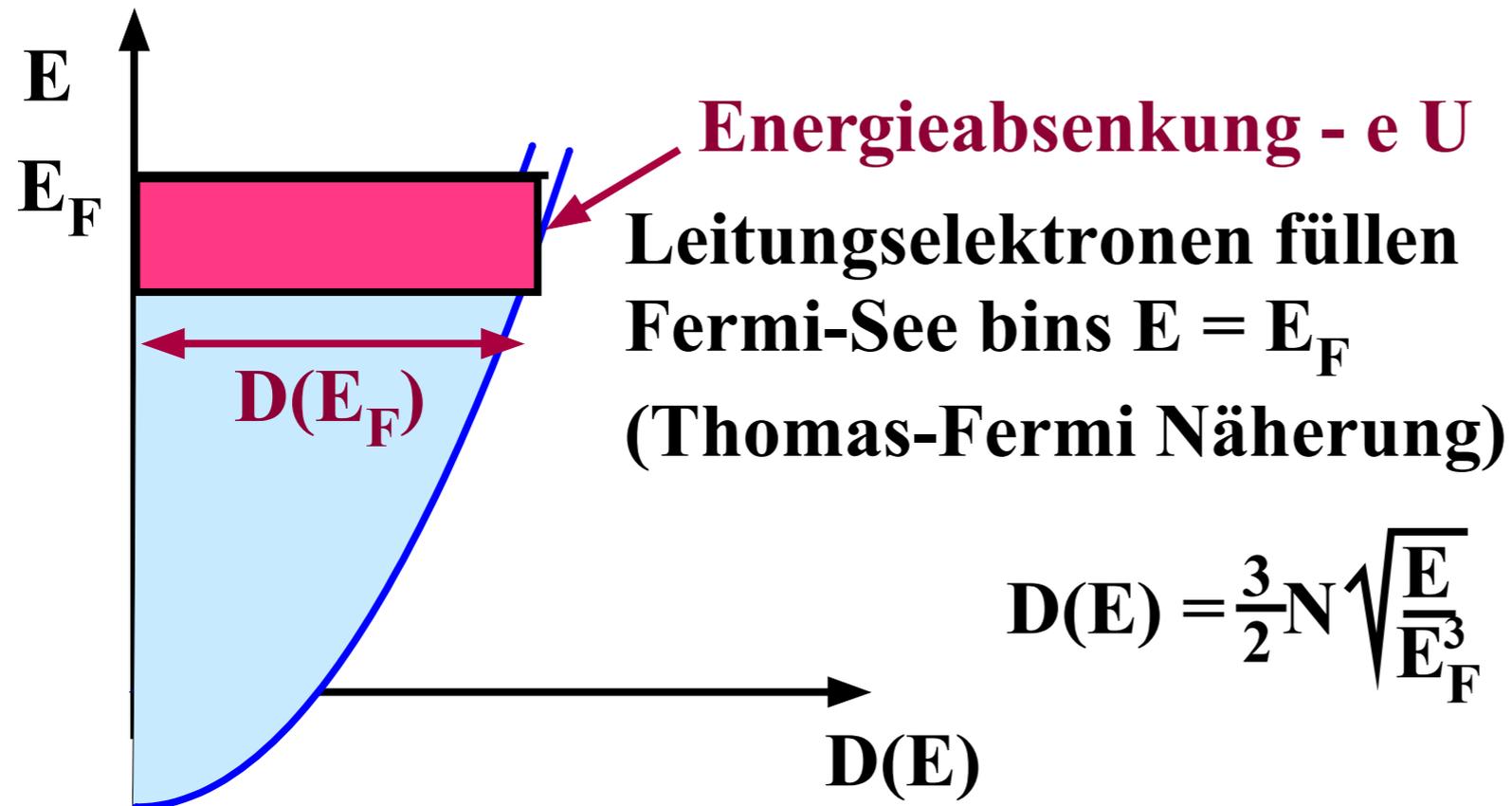
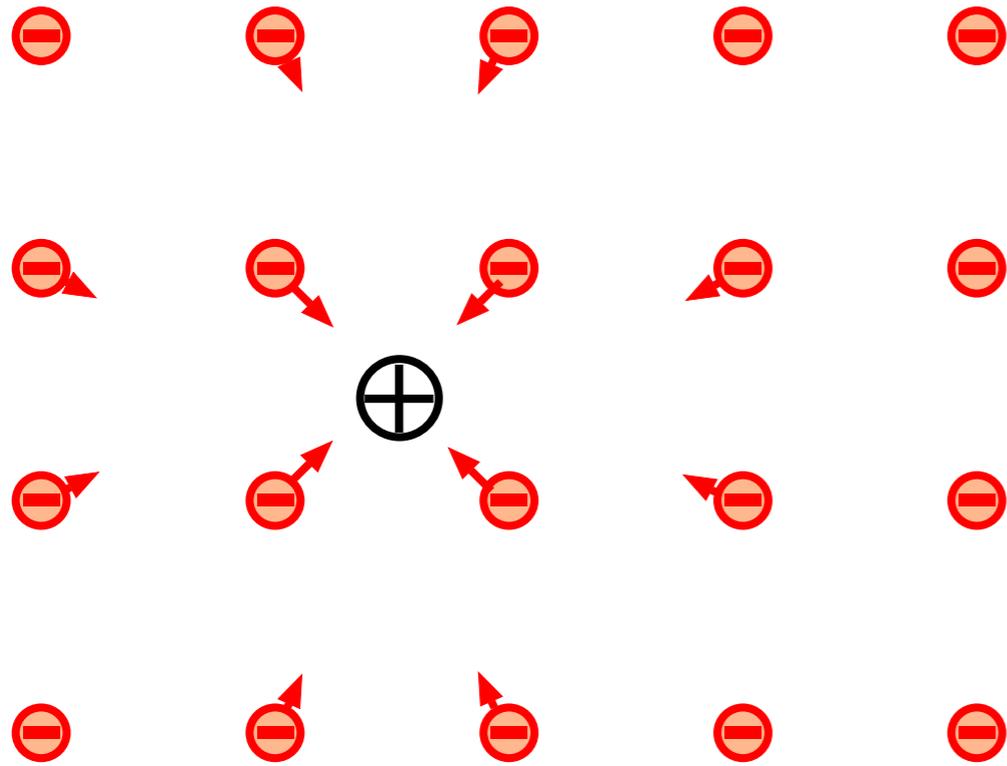
# Periodisches Potenzial



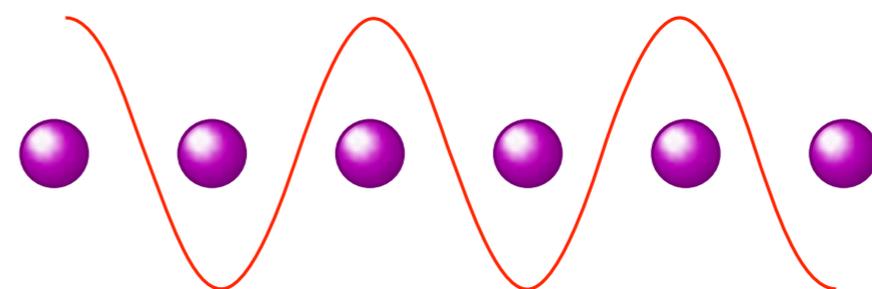
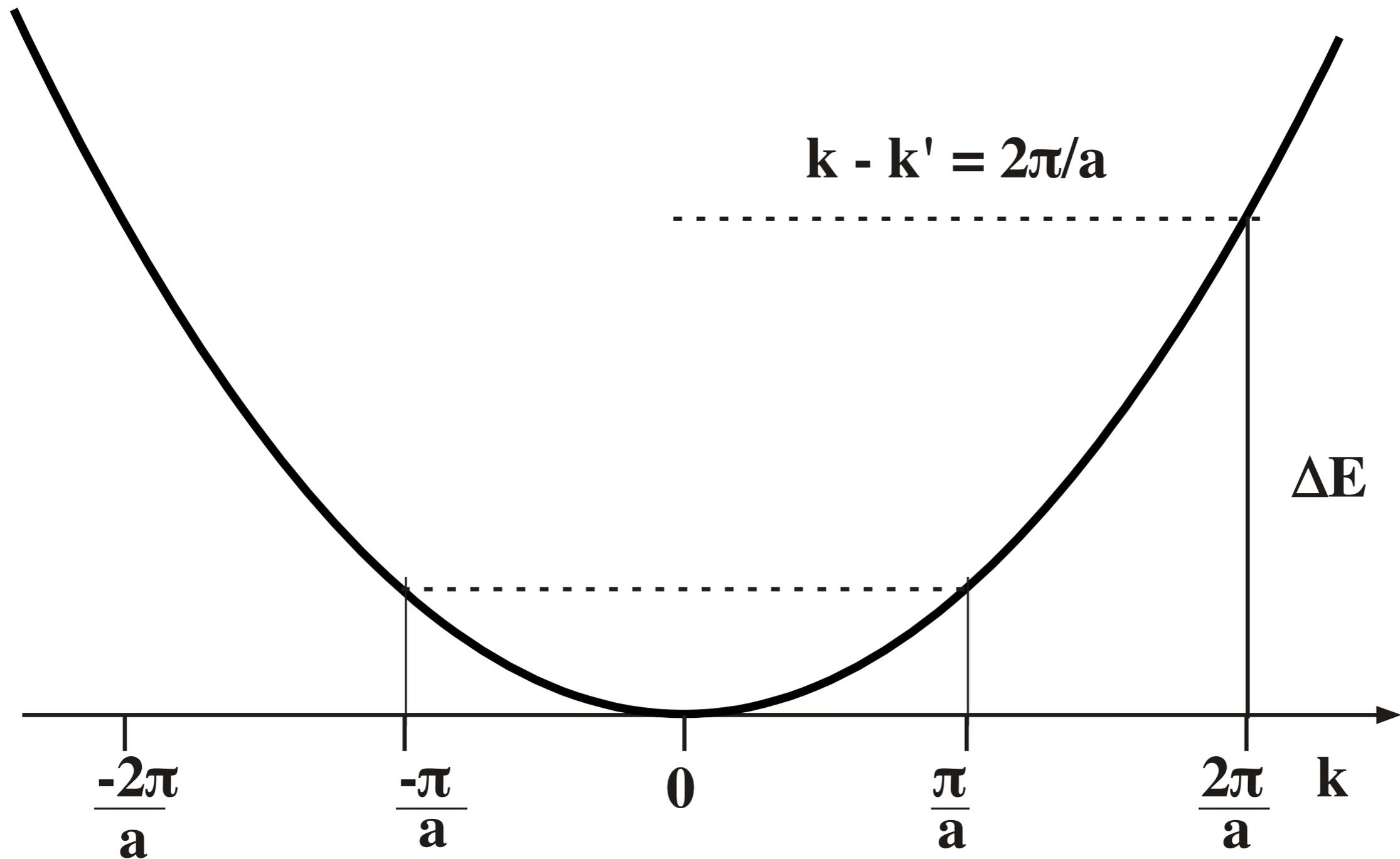
$$\langle e^{ik'x} | V | e^{ikx} \rangle = -z e^2 \sum_s e^{i(k-k')sa}$$



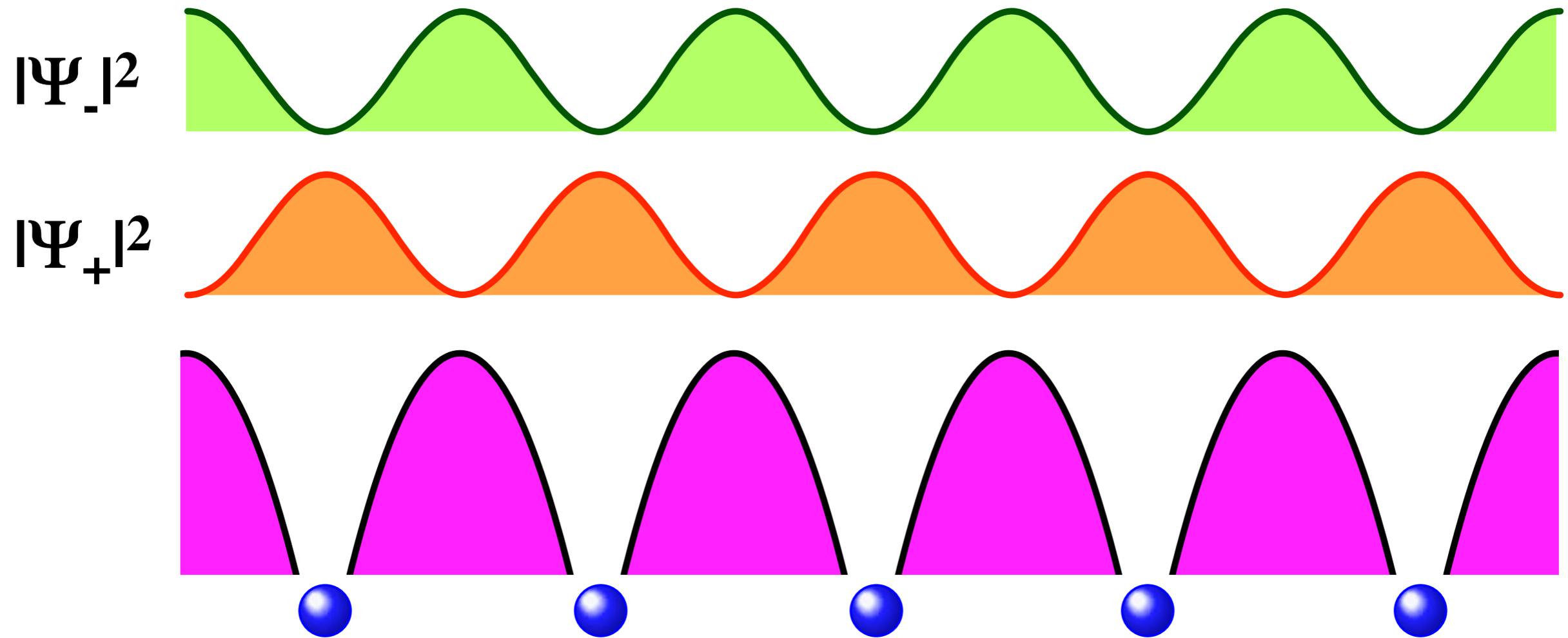
## Leitungselektronen



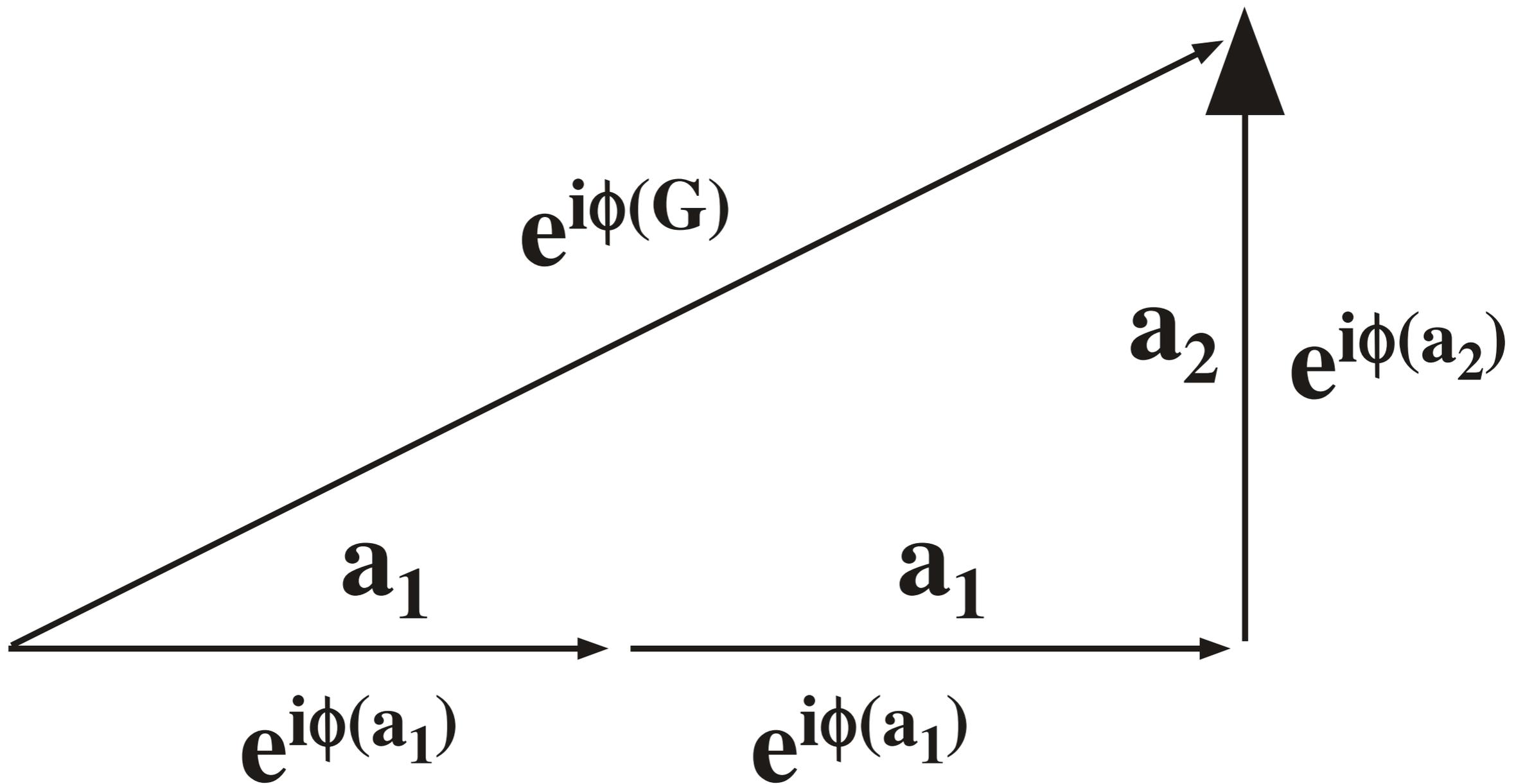
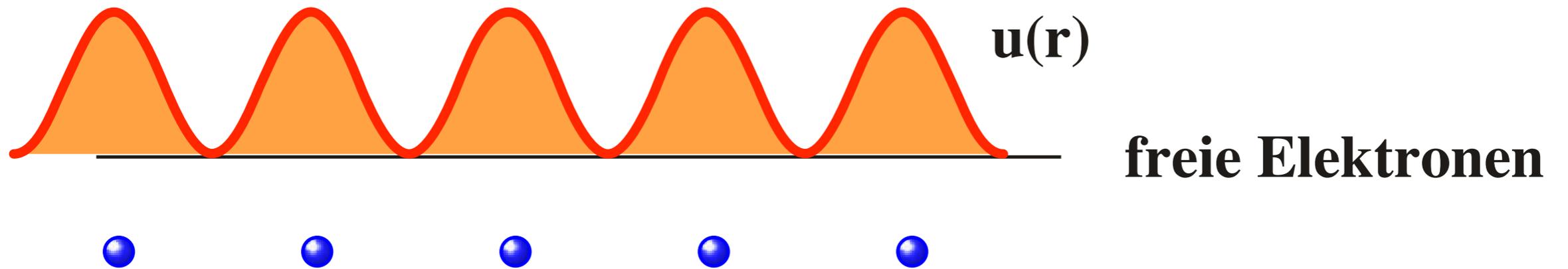
# Gekoppelte Bloch-Funktionen



# Zustände



# Bloch Zustände



# Bloch Zustände

