

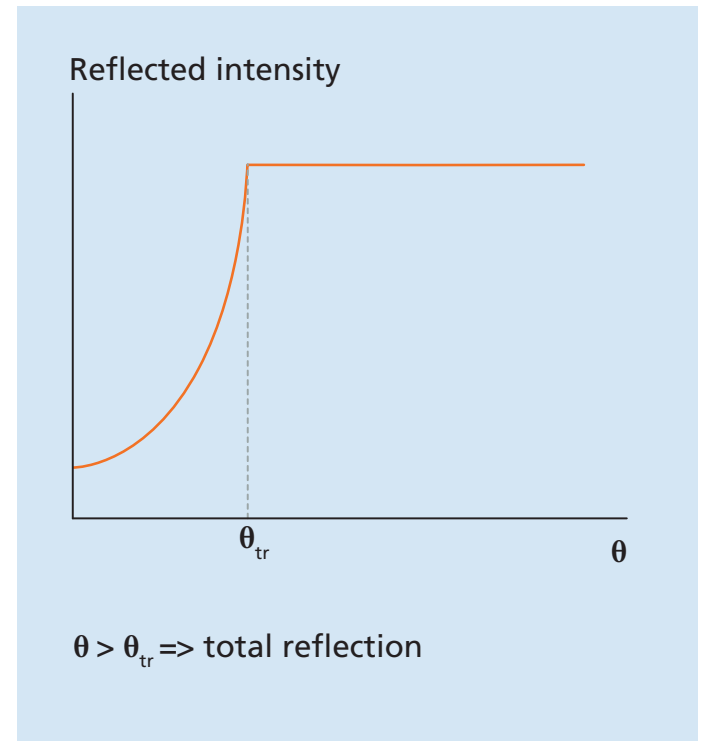
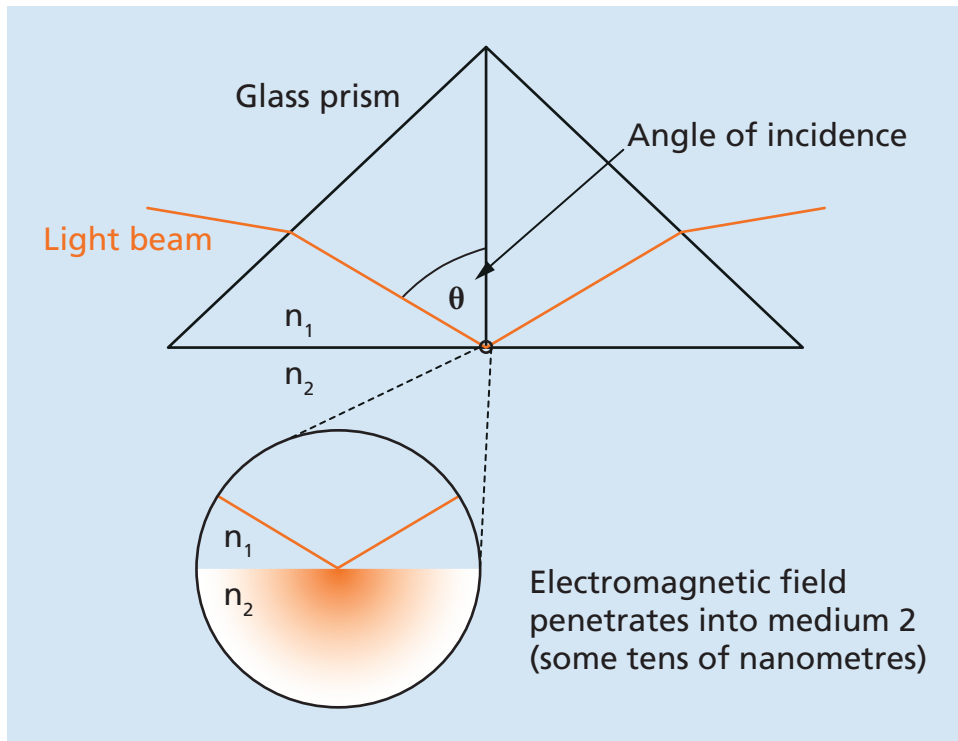
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# SURFACE PLASMON RESONANCE AND ITS UTILISATION IN SURFACE ANALYTICS

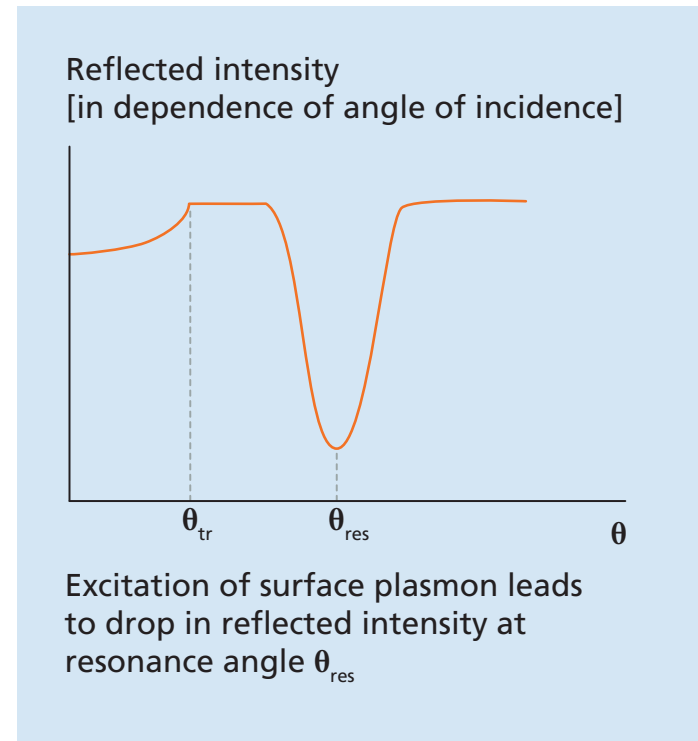
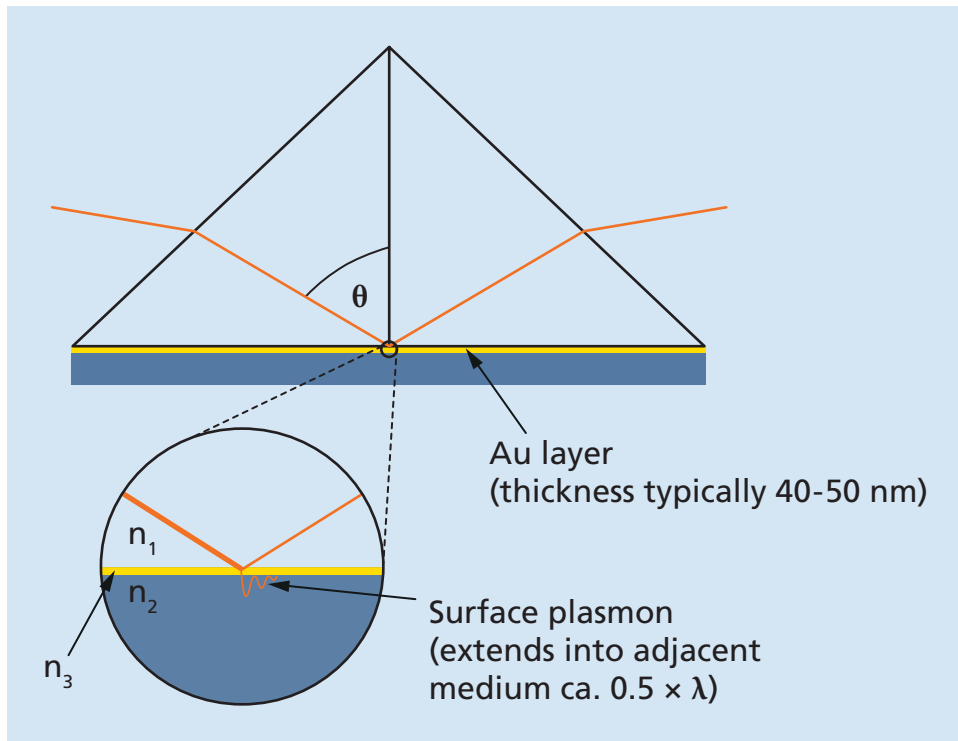
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- Evanescent Fields, Excitation of Surface Plasmons
- Physical Interaction of Plasmons and Adjacent Media
- Application of Surface Plasmons in Surface Science
- Bioanalytical Application

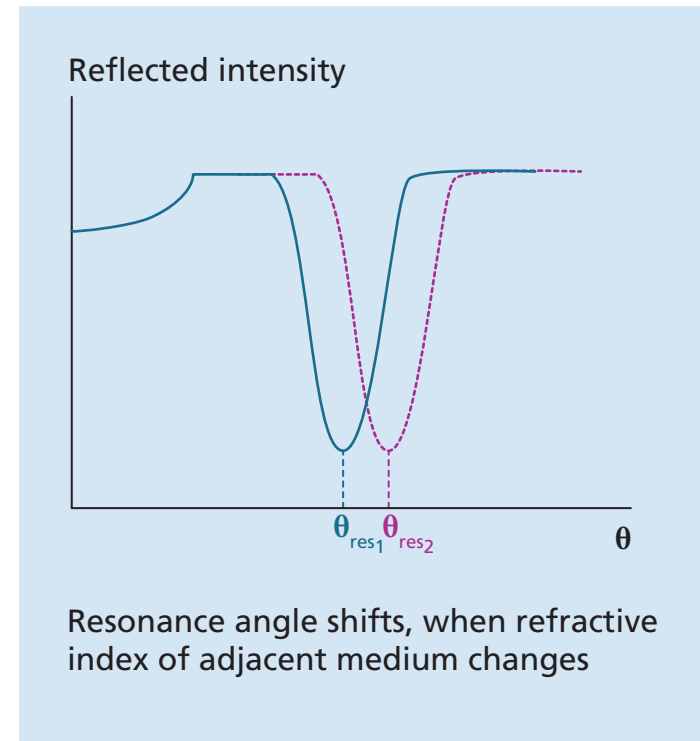
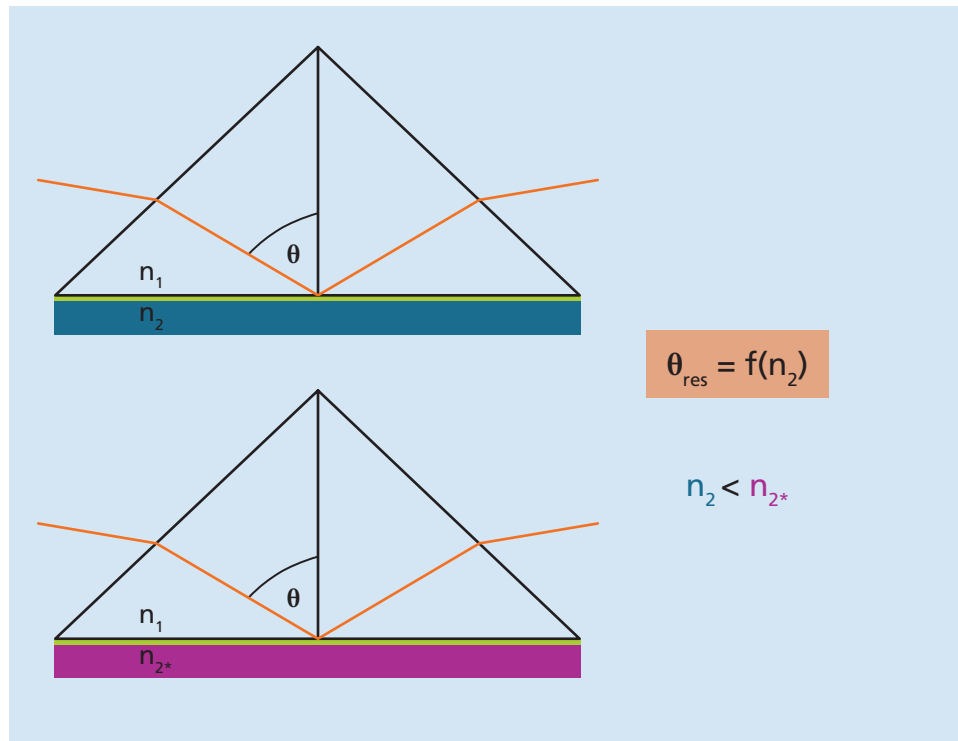
# Evanescent Fields



# Excitation of Surface Plasmons



# Physical Interaction of Plasmons with Adjacent Media

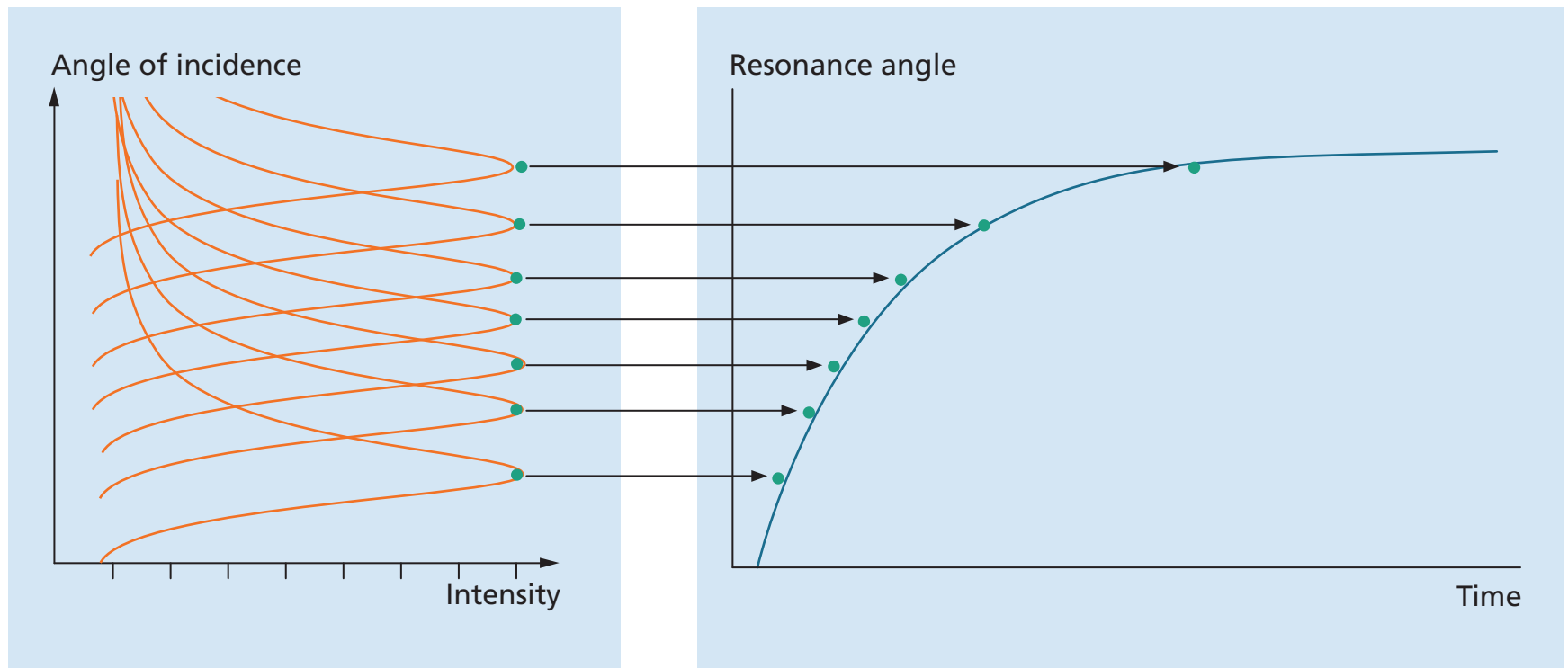


# Possible Applications

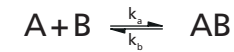
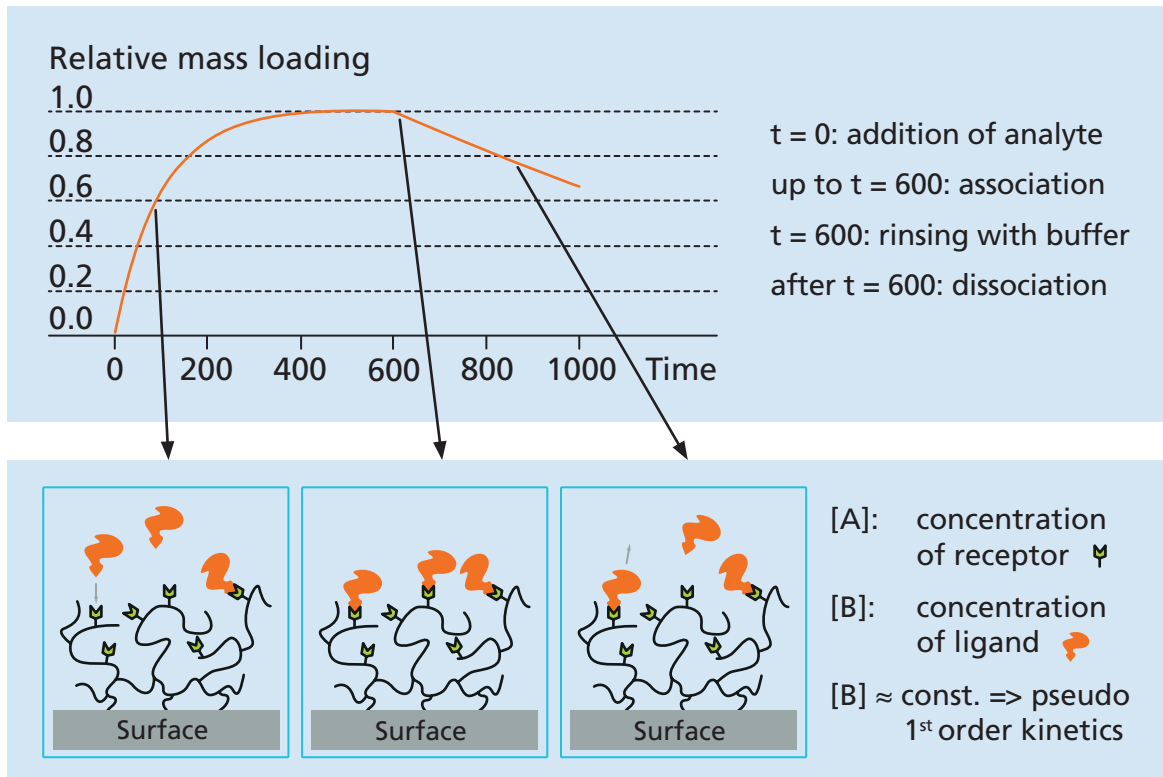
- Determination of bulk refractive index
- Monitoring of (stepwise) layer deposition
- Acquisition of kinetic data by real-time tracking of  $\theta_{res}$
- On-line monitoring of biochemical interactions (e. g. antibody - antigen)
- Determination of binding constants
- Acquisition of information about vertical layer structure

# Example:

## Time-resolved measurements: real-time tracking of $\theta_{\text{res}}$



# Example: Monitoring of biochemical interactions, determination of binding constants



$$R_{\max} = [A]_0$$

$$R_A = [AB] = [A]_0 - [A]$$

$$[A] = [A]_0 - [AB] = R_{\max} - R_A$$

$$\frac{dR_A}{dt}$$

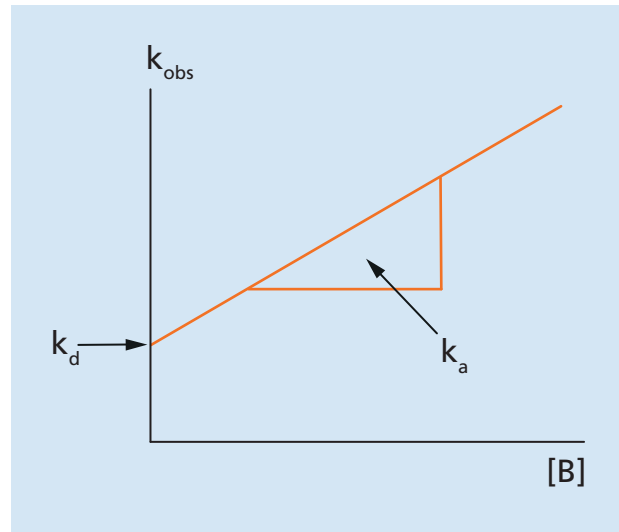
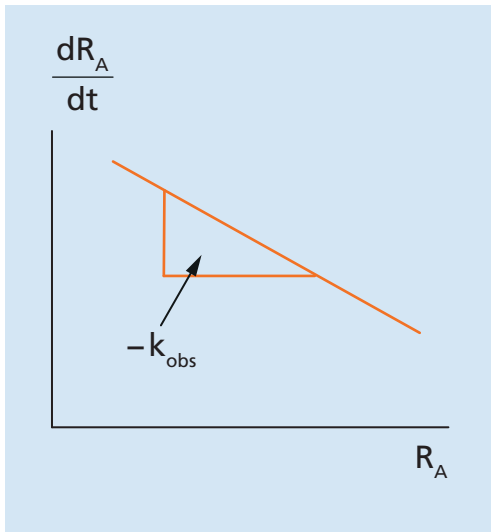
$$= \frac{d[AB]}{dt}$$

$$= k_a \times [A] \times [B] - k_d \times [AB]$$

$$= k_a \times (R_{\max} - R_A) \times [B] - k_d \times R_A$$

$$= k_a \times [B] \times R_{\max} - k_a \times [B] \times R_A - k_d \times R_A$$

$$= k_a \times [B] \times R_{\max} - (k_a \times [B] + k_d) \times R_A$$



$$R_A = R_A(t)$$

$$R_A = \frac{k_a \times R_{\text{max}} \times [1 - e^{-(k_a \times [B] + k_d) \times t}]}{k_a \times [B] + k_d}$$

$$\frac{dR_A}{dt} = k_a \times [B] \times R_{\text{max}} - \underbrace{(k_a \times [B] + k_d)}_{k_{\text{obs}}} \times R_A$$



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