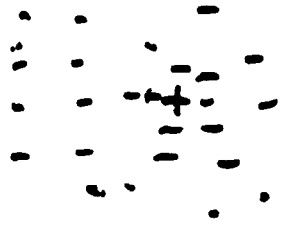


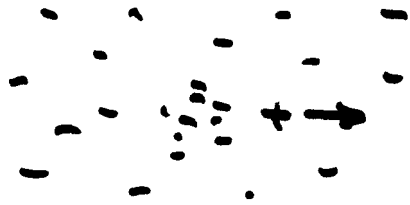
# Plasmon excitation

Overshoot of screening response

Sudden variation of charge

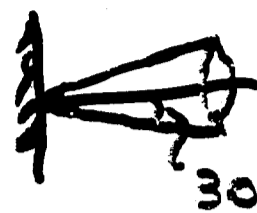
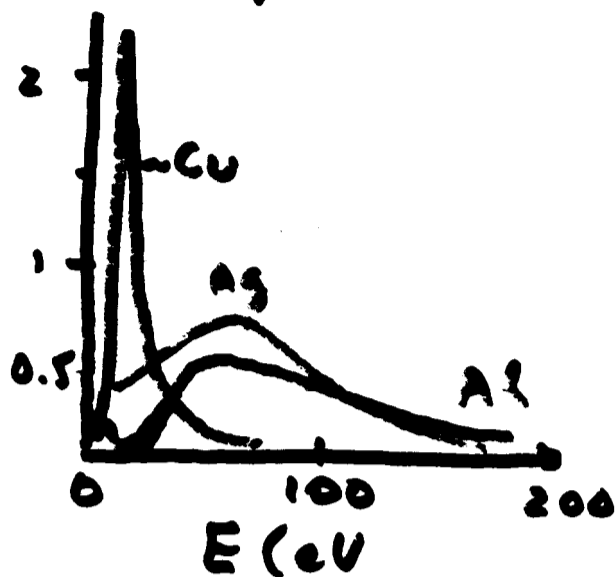


e.g. hole creation/  
annihilation



Fast charge.

$\sigma$  ( $10^{-16} \text{ cm}^2/\text{atom}$ ) .



backscattering

Calculated reflection cross sections

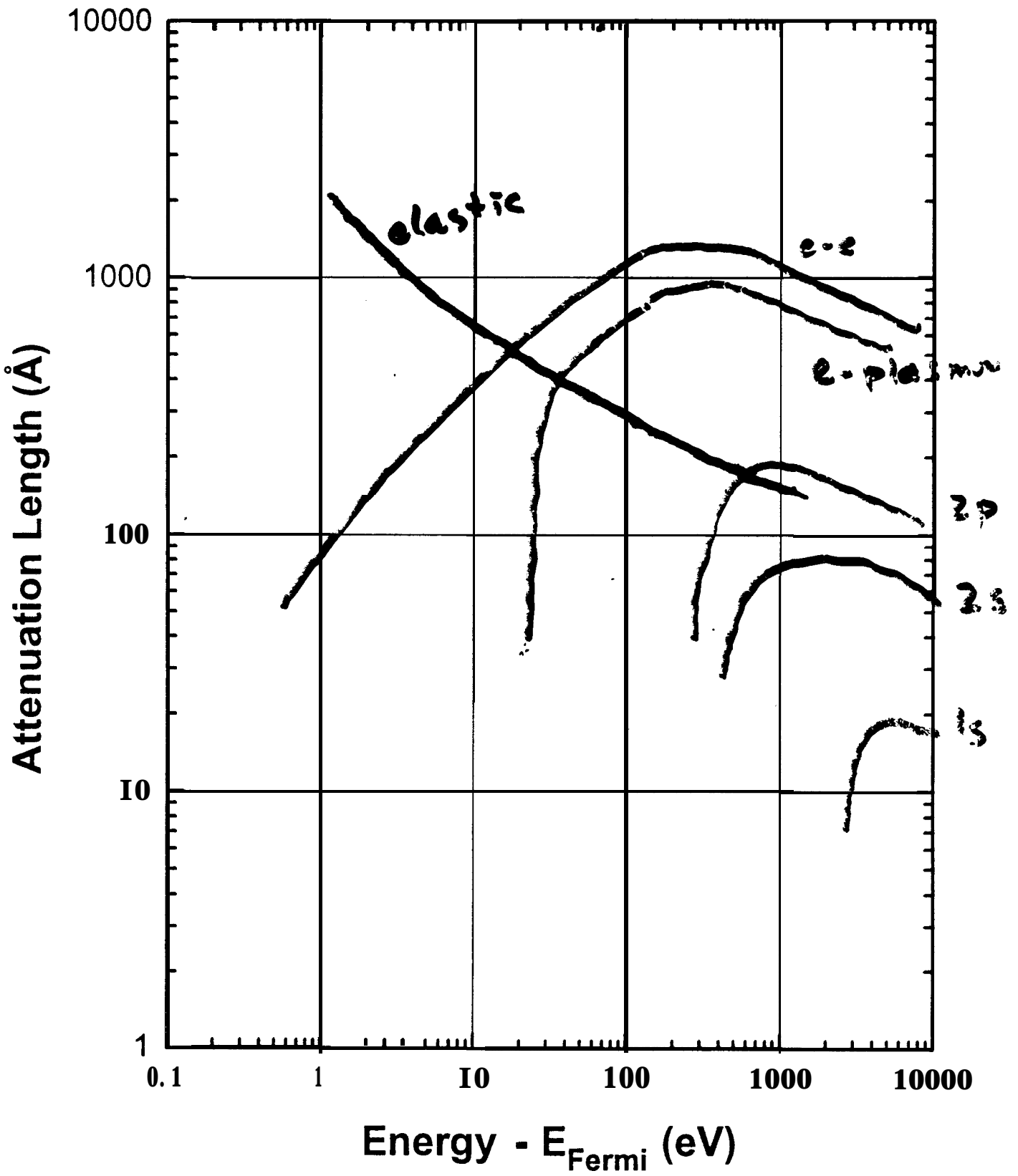
Probability of reflection

$$P = \sigma \cdot \frac{N}{A} \approx \sigma \cdot 1.5 \times 10^{15} \frac{\text{cm}^2}{\text{at}}$$

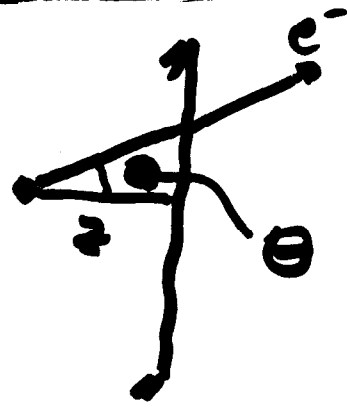
Scale above  $\rightarrow$   $P$  from 0 to 0.35

$\sigma(\text{electrons}) > 1000 \sigma(\text{x-rays})$

$\sigma$  (arb. units)



# Electron Attenuation

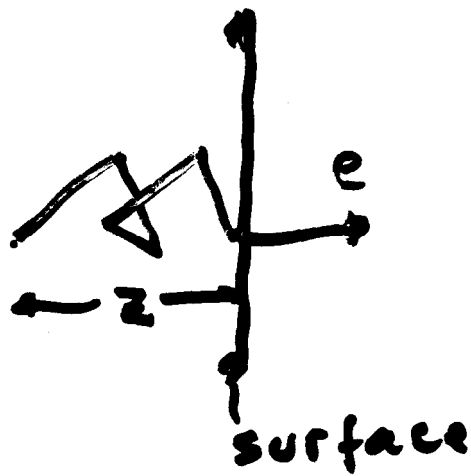


$P_{\text{survival}}$   
 $P = e^{-\frac{z}{L \cos \theta}}$

surface

Straight line  $\rightarrow$  no elastic scattering

$L =$  attenuation length



$P \approx e^{-\frac{z}{L}}$

strong elastic scattering

