

The physics of PENELOPE

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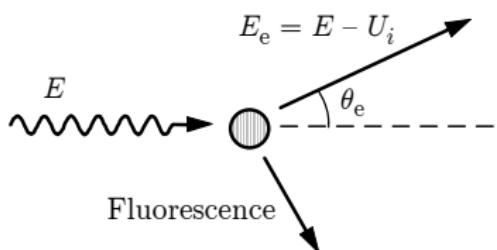
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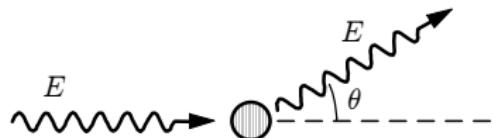
Universidade de São Paulo, 2019



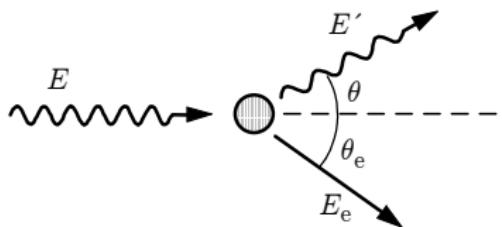
Interactions of photons



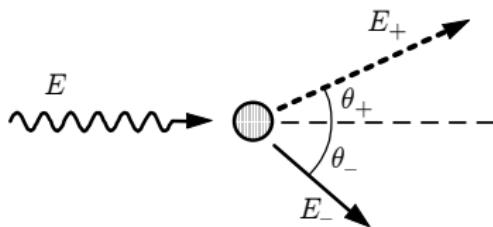
Photoelectric absorption



Rayleigh scattering



Compton scattering

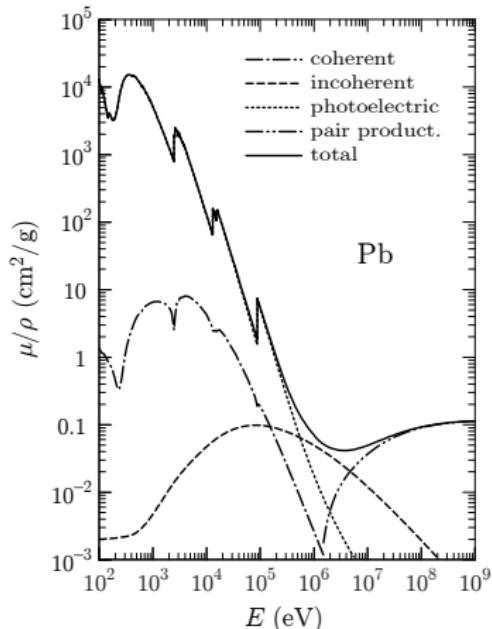
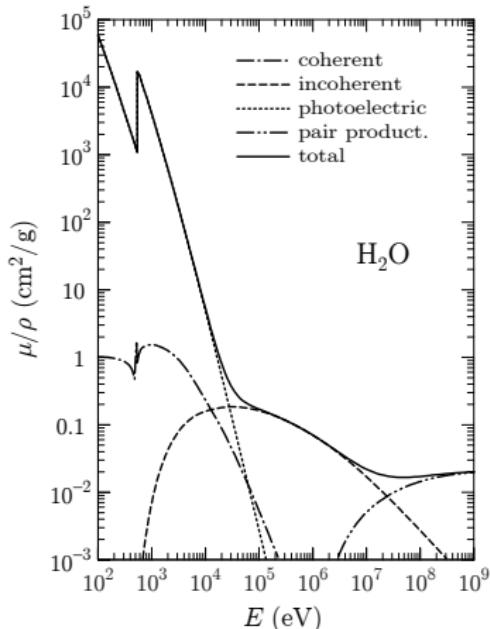


Pair production

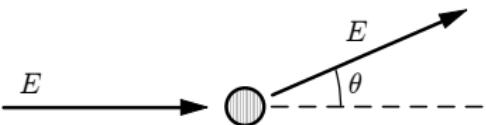
Detailed simulation

Mass attenuation coefficients

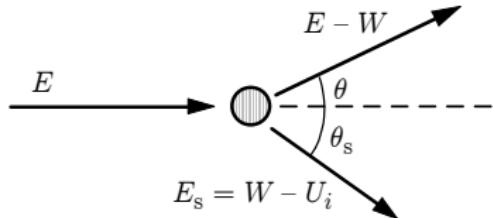
$$\frac{\mu}{\rho} = \frac{N_A}{A_w} (\sigma_{pe} + \sigma_{coh} + \sigma_{inc} + \sigma_{pp})$$



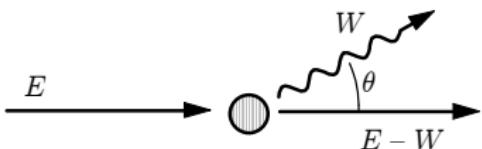
Interactions of electrons and positrons



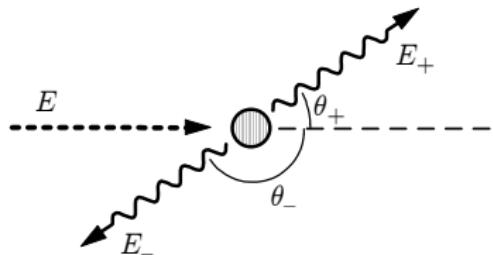
Elastic scattering



Inelastic scattering



Bremsstrahlung emission



Positron annihilation

Mixed (class II) simulation

Inverse mean free paths

$$(\rho\lambda)^{-1} = \frac{N_A}{A_w} (\sigma_{el} + \sigma_{in} + \sigma_{br})$$

