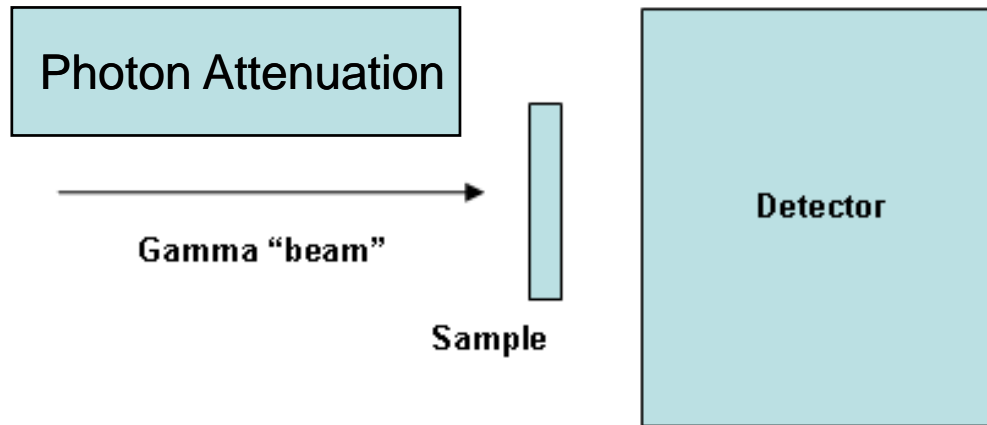
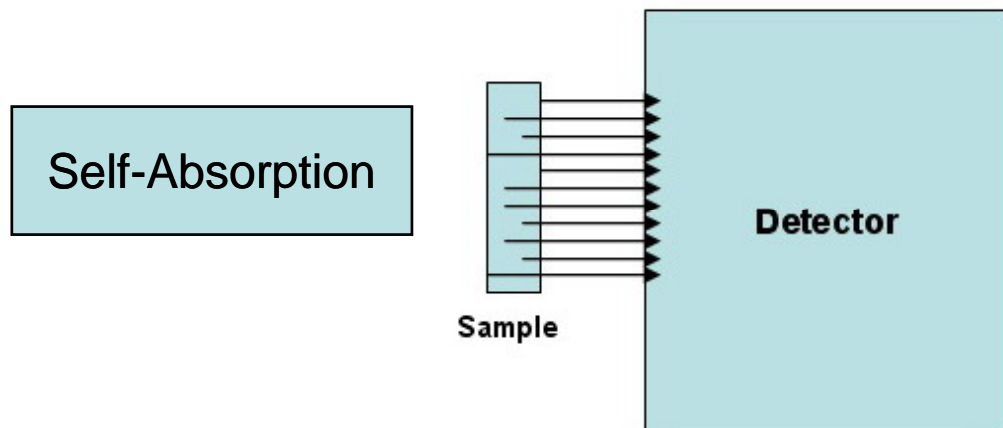


Self Absorption



$$I = I_0 e^{-\mu \cdot x}$$



HW 1

$$I = I_0 \frac{1 - e^{-\mu \cdot x}}{\mu \cdot x}$$

Valid for parallel
photon emission
or far geometries.

Self absorption

Calculation vs. Simulation

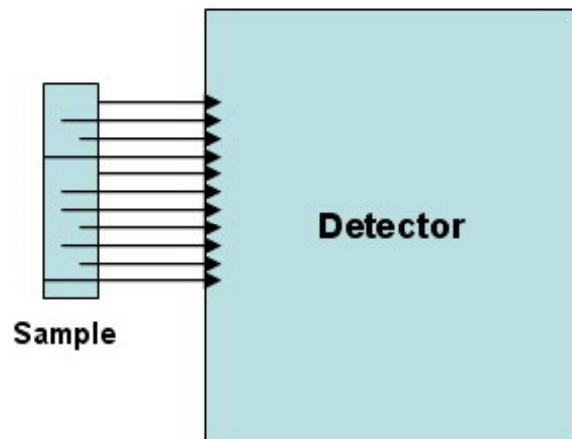
Data from XCOM

<http://www.nist.gov/pml/data/xcom/index.cfm>

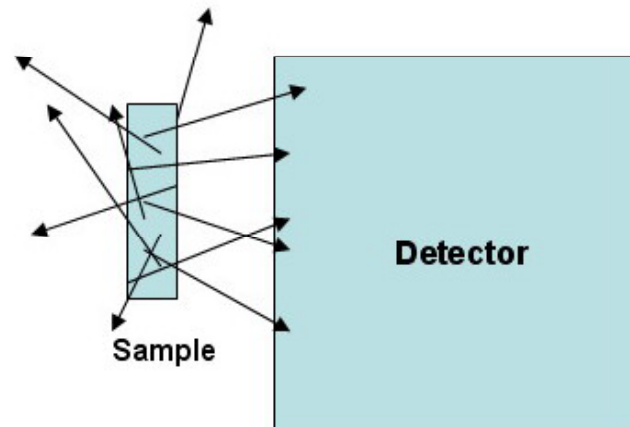
$$I = I_0 \frac{1 - e^{-\mu \cdot x}}{\mu \cdot x}$$

More
Realistic

Parallel Photon
Emission

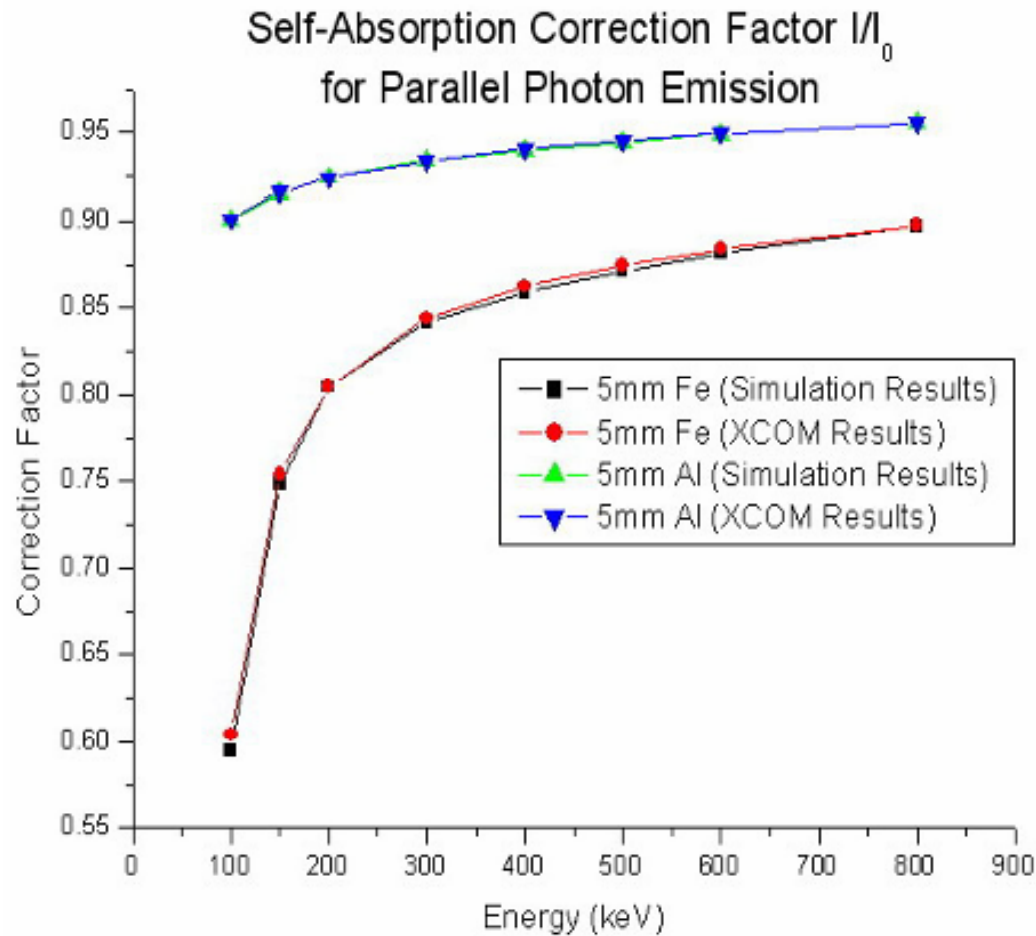


Isotropic Photon
Emission



Self Absorption

Geant4 vs. XCOM for **Parallel** Photon Emission

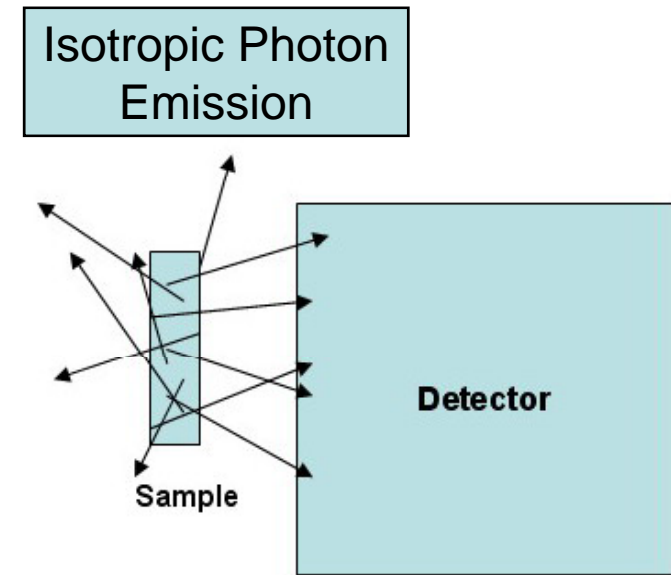
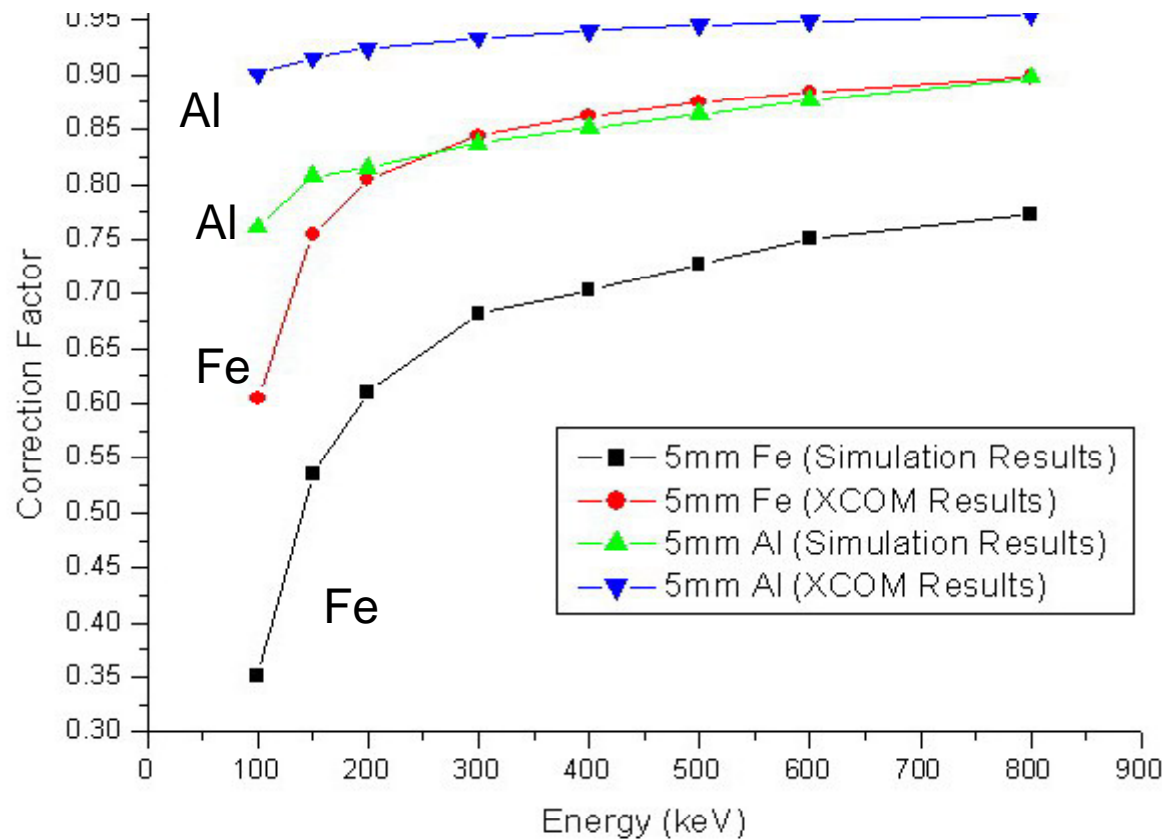


But
not
realistic

Self Absorption

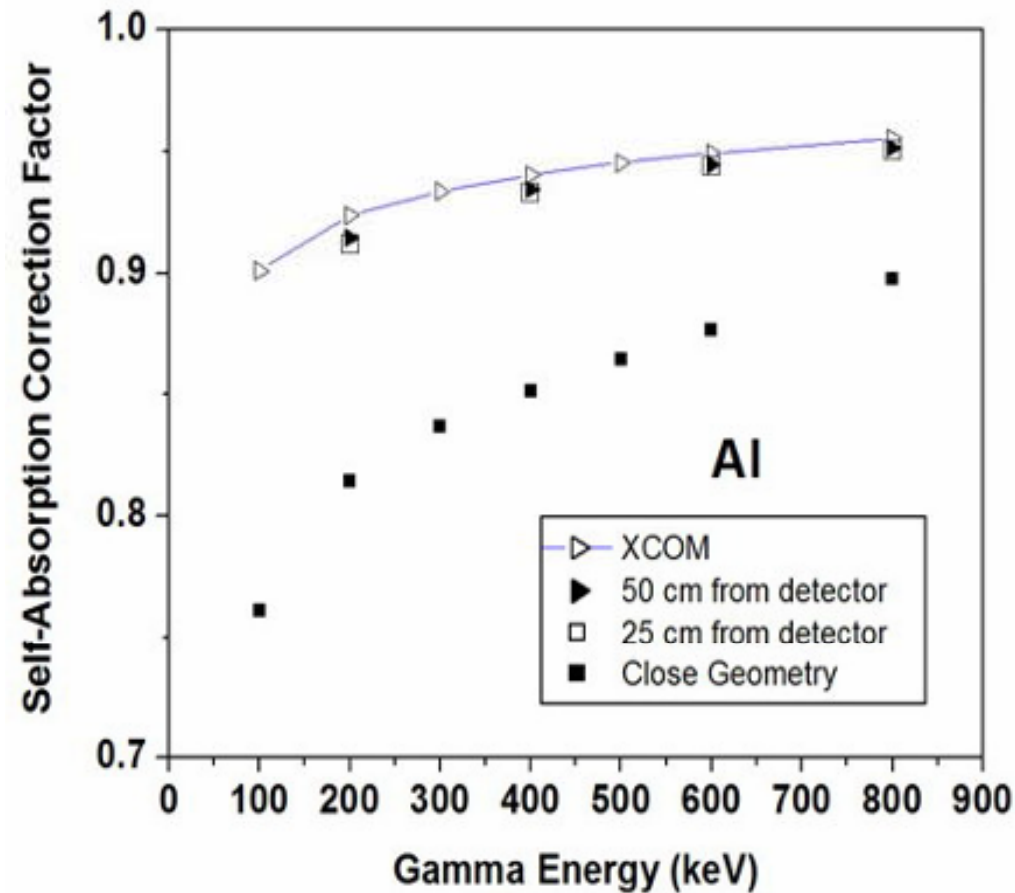
XCOM vs. Geant4 for **Isotropic** Photon Emission in **Close Geometry**

$$I = I_0 \frac{1 - e^{-\mu x}}{\mu x}$$



Self Absorption

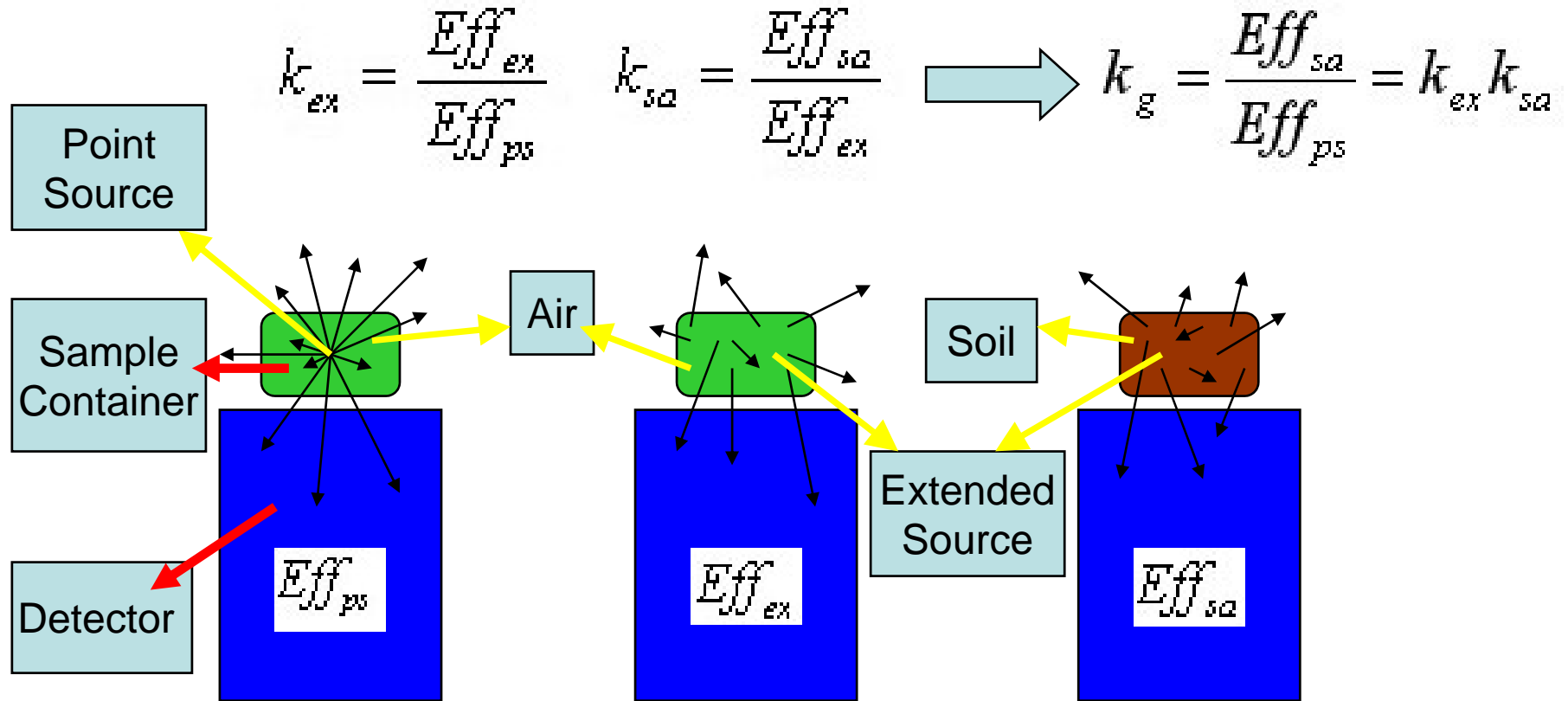
XCOM vs. Geant4 for **Isotropic** Photon Emission in **Close and Far Geometries**



Geometric Correction Factor

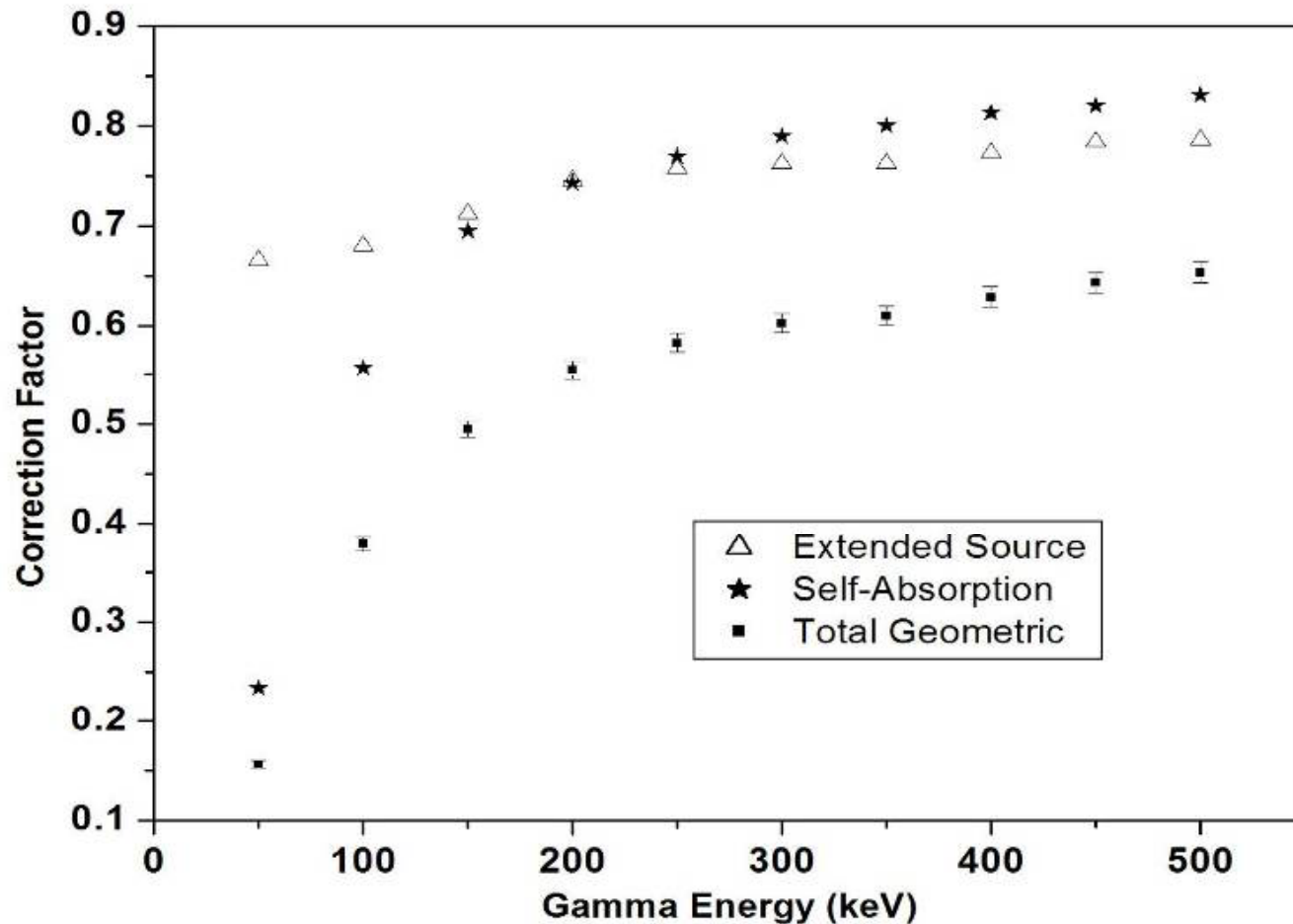
Total **Geometric** Correction Factor for Self-Absorption and Extended Source

No Coincidence Summing yet ...!



Geometric Correction Factor

GMX HPGe detector total geometric correction factor k_g for a soil sample of 4 cm height.



Simulated Efficiency Calibration

Efficiency Calibration of the GMX System for Environmental Samples

