## 22 32. Passage of particles through matter



Figure 32.15: Photon total cross sections as a function of energy in carbon and lead, showing the contributions of different processes [51]:

 $\sigma_{p.e.}$  = Atomic photoelectric effect (electron ejection, photon absorption)

 $\sigma_{\text{Rayleigh}} = \text{Rayleigh}$  (coherent) scattering-atom neither ionized nor excited

 $\sigma_{\text{Compton}} =$  Incoherent scattering (Compton scattering off an electron)

 $\kappa_{nuc} =$  Pair production, nuclear field

 $\kappa_e =$  Pair production, electron field

 $\sigma_{g.d.r.}$  = Photonuclear interactions, most notably the Giant Dipole Resonance [52]. In these interactions, the target nucleus is broken up.

Original figures through the courtesy of John H. Hubbell (NIST).

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