

Internal Compton effect

K. Pisk and I. Basar

Institute "Rudjer Bošković", Zagreb

The formalism for the calculation of the matrix elements for the Internal Compton effect (ICE) with exact treatment of the external field (static potential of the nucleus) is given. In Furry's picture the perturbation theory is developed in which the interaction of a bound electron with a real photon (photon in the final state) or virtual photon (photon from the electromagnetic transition of the nucleus) is described using the inhomogeneous Dirac equation in the external field. The inhomogeneity comes from the above interaction. This equation can be solved in partial-wave series if the conditions for the behavior of the wave function at zero and at infinity are taken into account. The amplitude for the ICE is expressed as a sum of radial integrals of partial waves of the inhomogeneous equation, of real or virtual photons and of the final state of the electron.