

ERL scheme for Compton polarised positron sources

One of the main challenges for the future projects of linear colliders (ILC and CLIC) is to provide an efficient positron source taking into account the constraint imposed by the target heating. At present, different schemes have been proposed to produce high energy gammas and to convert them in an amorphous target. One of them considers the possibility to boost the energy of the backscattered photons of a laser pulse by Compton effect. This method is particularly attractive since the source is independent from the main Linac and since the photon helicity is conserved in Compton Scattering and subsequently transferred to the produced pairs. This implies to dispose for physics experiments of both positron and electron polarised sources. Different schemes have been proposed to provide the electron beam for the Compton collision. They have to take into account the main constraint of this proposal which is the relative low value of the Thomson cross section. One of the possibilities is to design an ERL with relatively low repetition frequency and high charge per pulse and then to stack the produced positrons in an accumulation ring. Different considerations on this scheme will be illustrated and the main constraints discussed.

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