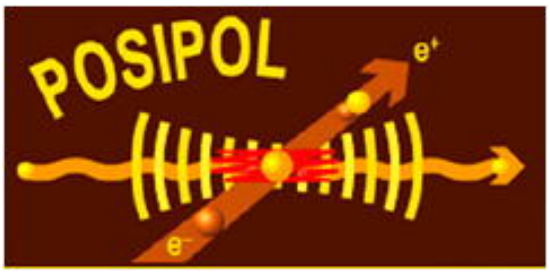

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Present roadmap for the CLIC positron sources

Tuesday, 23 June 2009 15:00 (30 minutes)

In a first stage, the CLIC baseline assumes unpolarized positrons using the enhanced photon yield in an axially oriented crystal due to channeling process. The generated photons are sent, a few meters downstream, to an amorphous target where e-/e+ pairs are produced. This set of targets, so-called hybrid target, is followed by a classical Adiabatic Matching Device and a pre-injector linac working at 2 GHz, accelerating e+ up to 200 MeV. In a second stage, the CLIC source assumes polarized positrons. The latter requires polarized photons which can be produced by a Compton process. The photon flux coming out from a Compton process is not sufficient to obtain the requested charge and a stacking process is required in the Pre-Damping Ring (PDR). Three options are under study: i) Compton backscattering taking place in a so-called "Compton ring", where an electron beam of 1 GeV interacts with circularly-polarized photons in an optical resonator; ii) Compton Energy Recovery Linac (ERL) where a quasi-continual stacking in the PDR could be achieved; iii) "Compton Linac" where a CO2 laser interacts with a high current electron beam inside several optical cavities and which would not require stacking. A positron source based on undulator scheme is also investigated as possible alternative option. Finally the roadmap should include an e+ source for a CLIC machine working at 500 GeV but with a doubled bunch charge.

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