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Non-Dipolarity of Axial Channeling Radiation at GeV Beam Energies

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We continued our investigation of the non-dipolarity of channeling radiation (CR) at GeV beam energies [1] which remarkably change the CR spectrum and its intensity [2]. The experimental proof that CR and coherent bremsstrahlung (CB) substantially influence the output of positrons at conversion of γ -radiation into e^+e^- pairs in crystalline targets has been given at the KEK B facility [3]. An advanced concept to create a non-conventional intense positron source, the so-called hybrid setup, has been suggested long time ago [4]. Motivated by the pending CLIC and ILC projects, active discussions of this concept did not drop and stay actual up to now [5,6,7].

Besides de-channeling [8,9], the non-dipolarity of CR at GeV beam energies cannot be neglected in realistic simulations of CR spectra [10] being the initial point for any evaluation of positron production via conversion of γ -radiation into e^+e^- pairs [5].

We for the first time consider the non-dipolarity of axial CR at electron beam energy of several GeV carrying out simulations based on realistic axial continuous potentials.

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