



Contribution ID: 123

Type: Oral presentation

Total Yield and Spectra of Positrons Produced by Coherent Bremsstrahlung from 10 –70 MeV Electrons

Monday, 24 September 2018 12:20 (15 minutes)

As known the radiation of high-energy electrons in aligned crystalline target (radiator) and subsequent electron-positron pair production in downstream amorphous target (converter), so called a “hybrid” solution [1, 2], might be an effective positron source.

Here we investigate the dependence of total positron yield and positron energy spectra on incident electron beam energy by means of computer simulation based on the method proposed in [3]. The hybrid scheme of positron source via photoconversion of coherent bremsstrahlung (CB) [4] from 10 –70 MeV electrons into electron-positron pairs is considered. Computer simulations are carried out taking into account positron stopping in a thick converter. For the initial electron beam with energy of 70 MeV the comparison of the total yield and the energy spectra of positrons obtained from photoconversion of CB with the ones from photoconversion of bremsstrahlung and channeling radiation [5] is carried out.

References

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Session Classification: S1.2 Channeling & Radiations in Crystals