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## Total Yield and Spectra of Positrons Produced by Channeling Radiation from 0.1 –1.5 GeV Electrons

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

The Mathematica™ code BCM-1 [3] developed by the authors enables calculating the trajectories and radiation spectra of electrons and positrons at channeling in crystals. This code combined with the approach suggested in [4] was used to perform the comparison of the positron yield in a thin amorphous W converter produced by bremsstrahlung, by axial  $\langle 100 \rangle$  and planar (110) channeling radiation in a W crystal [5].

Here we investigate the dependence of total positron yield from incident electron beam energy. The hybrid scheme of positron source using the radiation from 0.1 –1.5 GeV axially channeled electrons for the case of using W crystalline radiator and thick Si, Ge and W amorphous converters is considered. Computer simulation is carried out taking into account positron stopping in the converter.

### References

1. R. Chehab et al. Physics Letters B 525 (2002) 41.
2. X. Artru, R. Chehab, M. Chevallier, V.M. Strakhovenko, A. Variola, A. Vivoli, Nucl. Instr. Meth. B 266 (2008) 3868. G.Alexander, J.Barley, Y.Batygin, et al. Phys. Rev. Lett. 100 (2008) P.210801.
3. O.V. Bogdanov, E.I. Fiks, K.B. Korotchenko, Yu.L. Pivovarov, T.A.Tukhfatullin, J. of Phys.: Conf. Ser. 236 (2010) 1; doi:10.1088/1742-6596/236/1/012029.
4. V.A. Dolgikh, Yu.P. Kunashenko, Yu.L. Pivovarov, Nucl. Instr. Meth. B 201 (2003) 253.
5. S. V. Abdrashitov, O. V. Bogdanov, S. B. Dabagov, Yu. L. Pivovarov, T. A. Tukhfatullin, Nucl. Instr. Meth. B 355 (2015) 65-68; DOI 10.1016/j.nimb.2015.03.091

**Primary authors:** Dr BOGDANOV, Oleg (LNF&TPU); Mr ABDRAHSHITOV, Sergei (National Research Tomsk Polytechnic University); DABAGOV, Sultan (LNF); Dr TUKHFATULLIN, Timur (National Research Tomsk Polytechnic University); Prof. PIVOVAROV, Yury (National Research Tomsk Polytechnic University)

**Presenter:** Mr ABDRAHSHITOV, Sergei (National Research Tomsk Polytechnic University)

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