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Use of a superconducting solenoid as a matching device for the compact linear collider positron source

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A matching device with a strong magnetic field is used to capture positrons in the positron source of future e+e- colliders such as the Compact Linear Collider (CLIC) and the Future Circular Collider (FCC-ee). Compared to conventional matching devices such as flux concentrators, superconducting (SC) solenoids can have a much higher peak field, improving the capture efficiency and the positron yield. In this paper, we tested an analytic SC solenoid field and simulated the matching device for the CLIC positron source. Furthermore, we optimised the coil parameters for maximum positron yield. The results from a study of the latest high temperature superconductor based solenoid designed by PSI for the FCC-ee positron source is also presented.

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Footnotes

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Yes

Primary author: ZHAO, Yongke (CERN)

Co-authors: DOEBERT, Steffen (CERN); LATINA, Andrea (CERN); OLIVARES HERRADOR, Javier (CERN)

Presenter: OLIVARES HERRADOR, Javier (CERN)

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