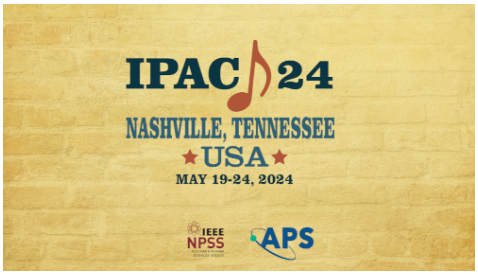


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# A crystal-based positron source for FCC-ee

*Tuesday, 21 May 2024 16:00 (2 hours)*

Positron source yield is a key factor for reaching the luminosity needed in future lepton colliders. Conventional scheme relies on a few GeV e-beam impacting on a high-density solid target to initiate an e.m. shower and collect the positrons after the target. This scheme is limited by the maximum heat load on the target before its structural failure.
An innovative approach to overcome such limitations exploits the large photon emission in axial channeling in a crystal radiator, to increase the positron yield and/or decrease the target thickness and therefore the Peak Energy Deposited Density in it. *Together with the conventional scheme, our crystal-based one is under study for the FCC-ee injector design. We carried out experiments at DESY and CERN PS with high-Z crystals (W and Ir) and tuned e-beam parameters useful for FCC-ee to validate a new simulation model implemented in Geant4*[**]. This model includes the modified photon production in channeling condition and oriented crystals in general. Capable of designing the full FCC-ee source. This new model was employed to simulate the positron source showing reduced energy deposition compared to conventional sources.

## Footnotes

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