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Novel positron source for PWFA experiments

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We present a novel, compact, low-emittance positron source that is compatible with existing PWFA and LWFA facilities (https://arxiv.org/abs/2301.08368). The device is based on a Penning-Malmberg trap that collects and cools positrons. The resulting beam has low thermal emittance (less than 1 micron), but it is magnetized and the bunch length is cm-scale. We describe a method for extracting and compressing the beam to 100 um-scale bunch lengths, which is compatible for acceleration in low-density PWFA experiments.

Primary author: GESSNER, Spencer (SLAC)

Co-author: HESSAMI, Rafi (SLAC)

Presenter: GESSNER, Spencer (SLAC)

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