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Simulations of positron capture at Ce+BAF

Monday, 20 May 2024 16:00 (2 hours)

We present an initial capture concept for the continuous wave (CW) polarized positron beam at the Continuous Electron Beam Accelerator Facility (CEBAF) upgrade at Jefferson Lab. This two-step concept is based on (1) the generation of bremsstrahlung radiation by a longitudinally polarized electron beam (1 mA, 120 MeV, >90% polarization), passing through a tungsten target, and (2) the production of e+e- pairs by these bremsstrahlung photons in the same target. To provide highly-polarized positron beams (>60% polarization) or high-current positron beams (>1 μA) with low polarization for nuclear physics experiments, the positron source requires a flexible capture system with an adjustable energy selection band. The results of beam dynamics simulations and calculations of the power deposited in the positron capture section are presented.

Footnotes

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Paper preparation format

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Region represented

North America

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