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Spin Polarized Positron Beam Upgrade for Jefferson Lab

Tuesday, 27 September 2022 09:00 (25 minutes)

Nuclear physics experiments requiring highly spin polarized positron beams are now proposed at the Continuous Electron Beam Accelerator Facility (CEBAF) at Jefferson Laboratory (JLab). To achieve this, a new polarized positron injector is imagined, where the positron beam polarization is derived from the bremsstrahlung of an intense continuous-wave (CW) spin polarized electron beam produced by strained super-lattice GaAs/GaAsP photocathodes in a high voltage DC photo gun.

This presentation describes the polarized positron injector and its integration to CEBAF 12 GeV, in particular the three important stages of positron beam delivery: polarized electron injector, positron target and collection beam line, and positron injection and transport within CEBAF. The requirements on the polarized electron source sustaining high ~mA beam intensity and on the positron conversion target operating >50 kW are especially demanding. The collection and compression of a CW positron beam will be unique.

Acknowledgement
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Category

Polarized Sources

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