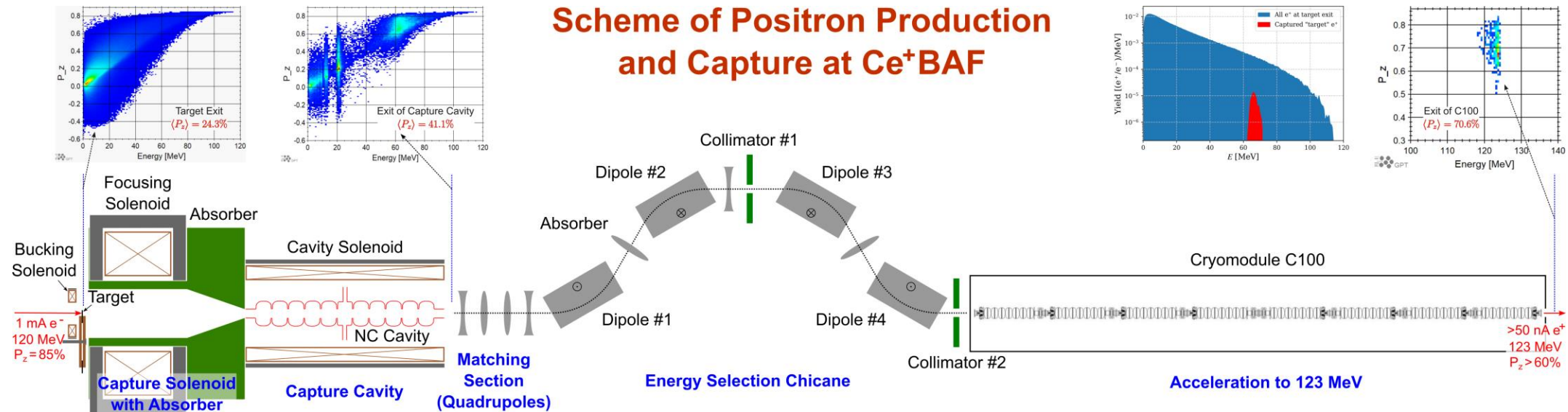


FY25 Q1: LDRD – Positron Injector Model Integrator – Strategic Hire (J. Grames, LD2505)

This work is supported by the Jefferson Lab LDRD program.

The new role of positron injector model integrator is to maintain and synchronize efforts in the evolution of an integrated end-to-end conceptual positron injector design in preparation of a defensible technical design report or pCDR.



FY25 Q1 Results

- ✓ Added to model of Ce⁺BAF injector: matching section and quadrupoles of energy selection chicane to capture highly polarized positrons with $\langle E \rangle \approx 63$ MeV and $\langle P_z \rangle \approx 70\%$ and optimized e⁺ capture in elegant (work together with **Salim Ogur**).
- ✓ Improved beam tracking simulations (GPT) in C100 cryomodule by using cavity field map provided by **Shaoheng Wang**.
- ✓ Simulated capture of different e⁺ groups with energies between 10 MeV and 60 MeV in different focusing solenoids: a) with a single 50 cm coil and b) 50 cm coil split into two halves. Field maps were provided by **Jay Benesch**. Studied impact of magnet field profiles on capture efficiency.

Objectives for FY25 Q2

- ❑ Simulate capture of positrons in the injector with shorter focusing solenoids: a) normal conducting solenoid with a 34 cm coil length and b) short super conducting solenoid (length will be defined based on simulation results), field maps from **Jay Benesch**
- ❑ Adjust parameters of e⁺ beam line (field strength of focusing solenoid, matching quads, dipoles, etc.) to maximize capture efficiency of e⁺ with different energies, collaborating with **Sami Habet**
- ❑ Meet with HEP colleagues at **JLAB/SLAC/KEK** collaboration meeting on e⁺ source projects in end of February to present/discuss the capture simulations for Ce⁺BAF injector

FY25 Q1: LDRD – Positron Injector Model Integrator – Strategic Hire (J. Grames, LD2505)

This work is supported by the Jefferson Lab LDRD program.

- Labor (PD) is tracking
- Promotion package submitted – anticipate uptick in labor around March
- Recommend Andriy presents at future quarterlies

WBS 1.04 Accelerator LDRD Projects
FY25 Period 03 - December 2024

Positron Injector Model Integrator (Strategic Hire) Joe Grames - LD2505 - WBS 1.04.LD.016.001 FY25 Budget: \$134.3 Loaded K\$

