

LDRD: Magnetized Beam for MEIC Bunched Electron Cooler

- I. Use JLab 350/500 kV Inverted Gun and K_2CsSb photocathode
- II. Design and build Cathode Solenoid
- III. Generate magnetized beam
- IV. Measure beam magnetization:
 - i. Measure beam emittance vs. beam size
 - ii. Measure directly using slit and screen
 - iii. Measure after round to flat transformation
- V. Study transportation of magnetized beam and round to flat beam transformation
- VI. Measure magnetized photocathode lifetime at high currents (5 mA – limited by HV supply)
- VII. Repeat with 100 kV thermionic gun loaned to TRIUMF