EXPERIMENT DESCRIPTION AND REQUIREMENTS

THE SUBMITTED INFORMATION IS CONSIDERED FROZEN. MODIFICATIONS TO THE EXPERIMENT SHOULD BE APPROVED BY THE DIVISION MANAGEMENT.

Experimental Hall: LEFR Gun Test Stand (GTS)

Experiment Number:	**Days Approved:** 3 years
LDRD 2016-2a	**Estimated Installation Time:** N/A
	Estimated Checkout Time: N/A

Spokespersons: Riad Suleiman and Matt Poelker

Short (Technical) Description of the Experiment (max 100 words)

This LDRD aims to generate magnetized beam in the GTS. We will design a new solenoid magnet to provide 0.2 T field at the photocathode. This magnet will need LCW and will be powered by an old CEBAF ARC power supply. For the first two years, we will use the standard GTS high voltage power supply. For the third year, we will use another supply that is capable of providing 32 mA. The beam line will be modified to add slits, YAG viewers and three quads. We plan to use the approved GTS lasers.

More information can be found at:
https://wiki.jlab.org/ciswiki/index.php/Magnetized_Beam_LDRD

List Beam Energies and Beam Days: (e.g. 30 Days at 11 GeV, 20 Days at 8 GeV)
Two years at 350 kV
Third year at 200 kV

List Range of Beam Currents: (e.g. 10-60 μA)
32 mA (200 kV), 4 mA (350 kV)

Base Equipment Used
(including description of conditions)

1. LERF Gun Test Stand (GTS) OSP: FEL-14-34782-OSP
2. GTS Glassman High Voltage Power Supply (HVPS) OSP: FEL-14-33223-OSP (600 kV, 5 mA HV supply)
3. Laser LOSP: LOPS forthcoming
4. Electron gun and photocathode preparation chamber

Modifications to Base Equipment
(or use of base equipment with different conditions)

1. Beam Line modifications: add slits, YAG viewers and three quads
2. Electron gun modifications: add solenoid magnet around HV chamber

New Equipment

1. A second HV supply: Spellman (225 kV, 32 mA). New OSP needed before use in third year.

2. Gun solenoid magnet
3. Solenoid power supply: (450 A, 150 V) that requires 480 V and LCW

Target Requirements: N/A

Beam Line Requirements
(including description of conditions)
Start with GTS base beam line. Then add slits, YAG viewers and three quads

Utilities Requirements

Power (MW): 0.1 MW (solenoid magnet power supply)

Power Supplies (V, I): Solenoid magnet power supply (150 V, 450 A)

Cryogenics (T, g/s): N/A

LCW (gpm): ? gpm (solenoid magnet power supply) + ? gpm (solenoid magnet) + 2.5 gpm (beam dump)

Cabling (#, ft): N/A

Other

Additional Requirements

Hazardous Materials: N/A

Flammable gases: N/A

Pressure Vessels: N/A

Platforms or Scaffolding: N/A

Other