

<p align="center">EXPERIMENT DESCRIPTION AND REQUIREMENTS</p> <p align="center">THE SUBMITTED INFORMATION IS CONSIDERED FROZEN. MODIFICATIONS TO THE EXPERIMENT SHOULD BE APPROVED BY THE DIVISION MANAGEMENT.</p>	
Experimental Hall: LEFR Gun Test Stand (GTS)	
Experiment Number: LDRD 2016-2a Magnetized Beam	Days Approved: 3 years Estimated Installation Time: N/A Estimated Checkout Time: N/A
Spokespersons: Riad Suleiman and Matt Poelker	
<p>Short (Technical) Description of the Experiment (max 100 words)</p> <p>This LDRD aims to generate magnetized beam in LERF Gun Test Stand (GTS). We built new solenoid magnet to provide 0.2 T field at photocathode. The magnet was installed in GTS in September 2016. This magnet needs LCW and will be powered by a new spare CEBAF dogleg power supply. The magnet operational safety procedure has been approved. Beam line will be modified to add slits, YAG viewers and three quads. We plan to use GTS base lasers.</p> <p>For first two years, we will use standard GTS high voltage power supply. In third year (2018), we will use another supply capable of delivering 32 mA. GTS is approved to operate up to 5 mA of beam current. We will work with RadCon Group for approval when we are ready to run at higher currents in the third year.</p> <p>We will use simulation tools to create a physics design for beamline so we can locate magnets and diagnostics at their optimum positions. Simulation of different operating scenarios of bunch charge, magnetization and bunch shape will be benchmarked against measurements.</p> <p>More information can be found at: https://wiki.jlab.org/ciswiki/index.php/Magnetized Beam LDRD </p>	
<p>List Beam Energies and Beam Days: (e.g. 30 Days at 11 GeV, 20 Days at 8 GeV)</p> <p>Two years at 350 kV Third year at 200 kV</p>	
<p>List Range of Beam Currents: (e.g. 10-60 μA)</p> <p>5 mA at 350 kV 32 mA at 200 kV</p>	
<p>Base Equipment Used (including description of conditions)</p> <ol style="list-style-type: none"> 1. LERF Gun Test Stand (GTS): ACC-16-63923-OSP (expires on November 7, 2019). 2. GTS Glassman High Voltage Power Supply (HVPS): ACC-16-63317-OSP (600 kV, 5 mA HV supply) (expires on October 20, 2019). 3. Laser LOSP: ACC-16-001-LOSP (expires on January 6, 2019). 	

4. Electron gun and photocathode preparation chamber
Modifications to Base Equipment (or use of base equipment with different conditions) <ol style="list-style-type: none"> 1. Beam Line modifications: add slits and three quads 2. Electron gun modifications: add solenoid magnet around HV chamber
New Equipment <ol style="list-style-type: none"> 1. Gun solenoid magnet: ACC-16-64488-OSP (expires on December 13, 2019). 2. Solenoid power supply: (80 V, 500 A) that requires 480 VAC input and LCW 3. A second HV supply: Spellman (225 kV, 32 mA). New OSP will be needed before use in third year (2018).
Target Requirements: N/A
Beam Line Requirements (including description of conditions) Start with GTS base beam line. Then add slits and three quads
Utilities Requirements <p>Power (MW): 0.04 MW (solenoid magnet power supply)</p> <p>Power Supplies (V, I): Solenoid magnet power supply (80 V, 500 A)</p> <p>Cryogenics (T, g/s): N/A</p> <p>LCW (gpm): 2 gpm (solenoid magnet power supply) + 4 gpm (solenoid magnet) + 2.5 gpm (beam dump)</p> <p>Cabling (#, ft): N/A</p> <p>Other</p>
Additional Requirements <p>Hazardous Materials: N/A</p> <p>Flammable gases: N/A</p> <p>Pressure Vessels: N/A</p> <p>Platforms or Scaffolding: N/A</p> <p>Other</p>