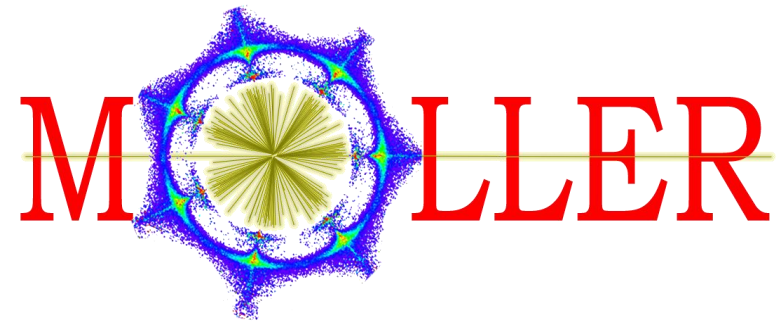


MOLLER Accelerator Tasks

Hall A

2025 – 2028



Riad Suleiman

November 23, 2022

MOLLER Requirements

1. Beam energy ≈ 11.0 GeV
2. 65 μA with 90% polarization (max 70 μA for target studies)
3. Fast helicity reversal:
 - I. 1920 Hz, 10 μsec settle time, 64-window pattern, 128-window delay
4. Slow helicity reversals:
 - I. Insertable half-wave plate (IHWP)
 - II. Wien Filters
 - III. g_e -2 ($\Delta E \sim 93$ MeV)
5. Feedbacks on:
 - I. Helicity-correlated beam charge
 - II. Helicity-correlated position and angle
 - III. Polarization orientation
6. Adequate adiabatic damping of transverse phase-space
7. Small helicity-correlated beam asymmetries
8. Acceptable beam halo

MOLLER Accelerator Tasks

1. CIS Tasks (Suleiman):

1. New settings for Helicity Generator Board (with I&C and Fast Electronics)
2. Helicity Decoder Boards (with Ohio Univ and Fast Electronics)
3. New RTP HV Drive (with UVA and I&C)
4. Upgrade IA system (with I&C)
5. Upgrade Helicity Magnets Control (with I&C, Injector and CASA)
6. Feedback on Horizontal Polarization Orientation (with Injector and CASA)
7. Wien Filters slow reversal (with Injector and CASA)

2. CASA Tasks (Roblin):

1. Adiabatic damping from 200 keV to Hall A
2. Fast Feedback (FFB) System re-design (with I&C)
3. Compton Polarimeter Setup
4. Beam Dithering (with MOLLER and I&C)

MOLLER Accelerator Tasks

3. OPS:

1. Study co-operation of MOLLER with K_L experiment in Hall D – 0.64 pC @ 7.8 MHz (128 ns, 5 μ A average current) to Hall D and 0.26 pC @ 249.5 MHz (4 ns, 65 μ A average current) to MOLLER:
 - I. Beam loading in Bunchers and SRF cavities in Linacs? Digital RF? **(Tiefenback)**
 - II. Any photocathode issues? **(CIS with Injector)**
2. Any conflicts with other Halls? Need Experimental Schedule for 2025-2028 **(Suleiman)**
3. Complete Injector Upgrade and commission (with CIS and CASA) **(Poelker)**
4. Robust Ion Chambers inside MOLLER Spectrometer
5. New BPM receivers in Hall A line (instead of S/H cards)
6. New BCMs/Electronics in Hall A line
7. Halo Monitors in Hall A **(Pitt)**