

Mott Commissioning / Spring 2014 Highlights (January 1, 2014 - June 1, 2014)

January

- 3 Discriminator thresholds changed
- 3 New 31MHz timing signal to DAQ**
- 6 CAMAC to VME upgrade completed w/ future punchlist
- 13 Hall C laser 31MHz w/ 1ns seed pulse
- 13 New Cu dump end flange received
- 13 Discriminator thresholds changed
- 13 Found Mott camera mis-aligned
- 13 Found 12" long mu-metal on 3D line mis-steered beam
- 13 499MHz & 31MHz beam to Mott from A/C lasers**
- 13 Commissioning summary plots runs 7237-7243
- 27 Mott setup script tested
- 27 Bad Down-dE is found to be a bad cable**
- 28 Mott tested with Hall C laser 62MHz w/ 1ns seed pulse run 7249

February

- 10 Hall C laser returned 31MHz and KE=5MeV setup
- 10 Tested CW BLM, BCM, target motion FSD all OK**
- 10 Completed PMT HV calibration w/ Hall A laser 499MHz
- 10 Instrumental asymmetry vs. position @ 31MHz 1um Au runs 7266-7272
- 11 Verified no rate w/ beam off, i.e. no 0L02 FE
- 11 Start of instrumental systematics studies
- 11 New dE PMT HV setpoints
- 11 Sleuthing L/R instrumental asymmetries
- 11 Identified dE HV too low leading to missed dE-E coincidences**
- 11 End with 3 dump runs (0, +5, -5 Amps) @ 499 MHz
- 12 Added useful run signals to S2 (ungated counters)
- 12 Solved a dead time issue - increased OR'd Mott trigger from 1ns to 20ns**
- 13 Cu dump cleaned, cooling circuit finished
- 13 Archiving 96 channels in EPICS + MottRunNumber added
- 13 Commissioning 31MHz 1um Au**
logbooks.jlab.org/entry/3269732
 - **Asymmetry vs. current 0-5uA runs 7312-7318**
 - **Asymmetry vs. position 1uA runs 7319-7328**
 - **Asymmetry vs. dump dipole/empty 1uA runs 7329-7334**
 - **Asymmetry vs. spot size/shape 1uA runs 7335-7337**
 - **Measurement summary**
logbooks.jlab.org/entry/3269965
- 16 Identified 900kB data file limit issue

16 Asymmetry vs. kinetic energy (3,4,5,6) 31MHz 1um Au runs 7344-7355

16 Null vertical polarization runs 7356-7358

16 Explore Cu (1.0, 4.1, 8.0 um) 31MHz runs 7359-7361

17 Cu (3 foils) runs 7365-7384

logbooks.jlab.org/entry/3270433

17 Vacuum performance during Cu runs

logbooks.jlab.org/entry/3270435

17 Changed dE delays from boxes to cables and then backed out

17 Explore Au (7 foils) runs 7387-7393

18 Au (7 foils) logbooks.jlab.org/entry/3270650

- **Foil#16 - 50min (Au:5um) : Run 7394 - 7403**

- **Foil#15 - 60min (Au:1um) : Run 7404 - 7409**

- **Foil #4 - 60min (Au: 0.75um) : 7410 - 7415**

- **Foil #5 - 75min (Au: 0.50um) : 7416 - 7421**

- **Foil #14 - 120min (Au: 0.35um) : 7422 - 7427**

- **Foil #12 - 2h45m (Au: 0.05um) : 7428 - 7434**

- **Foil #13 - 1h0m (Au: 0.05um) : 7435 - 7436**

18 Explore Ag (5 foils) runs 7438-7442

logbooks.jlab.org/entry/3270728

18 OL02 trip low liquid level

18 Target ladder brass worm gear loosened, needs replacement

19 Vacuum vs. operation + planning

logbooks.jlab.org/entry/3270788

19 Tightened ladder gear, verified home never lost

19 Asymmetry error calc error fixed

logbooks.jlab.org/entry/3270814

19 Compare 31/499MHz with/without chopping apertures using Mott TDC

20 Ag (4 foils) runs 7452-7483

logbooks.jlab.org/entry/3270977

- **Ag: 10um, Runs 7452-7457**

- **Ag: 4.5um, Runs 7458-7463**

- **Ag: 1.6um, Runs 7464-7474**

- **Ag: 0.45um, Runs 7475-7483**

20 Au (foil#13) runs 7484-7485

20 Mott shutdown for SAD

25 Vent Mott: adjust mirror, window port, add GP-100 NEG, replace dump

25 Upgrade details: logbooks.jlab.org/entry/3271331

26 Mott baked 18h, NEG activated, dump LCW

logbooks.jlab.org/entry/3271368

27 Vacuum good, improvement

logbooks.jlab.org/entry/3271417

- 27 Dump LCW FSD interlocked OK
27 Camera aligned to target ladder OK
27 Dump operational limits changed to 1kW w/ LCW and 34W w/o LCW
27 Dump temp monitor: webdaq.acc.jlab.org
logbooks.jlab.org/entry/3271442
28 Dump monitoring described logbooks.jlab.org/entry/3271535

March

- 8 Dump tests Au 1um Hall C 31MHz and Hall A 31/499MHz w/ (0, +5, -5 A)
30 Dump temp and vacuum to 30uA CW
logbooks.jlab.org/entry/3278662
31 OTR 6uA Cu 1um visible logbooks.jlab.org/entry/3279045

April

- 4 High current testing logbooks.jlab.org/entry/3280208**
 - **Dump to 75uA**
 - **Au 0.5um to 40uA, no OTR**
 - **Au 0.05um to 40uA, OTR>1uA but foil failed (suspect=formvar)**

8 DAQ MVME6100 (iocmdaq1) replaced by SBC (sbcmdaq0)
18 First DAQ upgrade beam test logbooks.jlab.org/entry/3282109
19 Cryounit exit emittance (3-7 MeV/c)
logbooks.jlab.org/entry/3282199
23 Able to analyze data files >2GB
24 Mott DAQ upgrade summary logbooks.jlab.org/entry/3282791
26 Second DAQ upgrade beam test logbooks.jlab.org/entry/3283024
28 Cryounit entrance emittance (550keV)
logbooks.jlab.org/entry/3283454
28 Mott DAQ Testing: 3283480
29 MOTTLOG created (all previous entries in POLOG)
30 DAQ upgrade done
devweb.acc.jlab.org/CSUEApps/atlis/task/14092

May

- 9 BeCu Dump study @ 31 MHz
 - 7650-7662 Different foils with beam current adjusted to created 1.5KHz trigger rate, dump dipoles both at 0A
 - 7663-7667 Thru target with various dump dipole settings - ({5,0,-5},{5,0,-5}) Amps
 - [3286038](#)

9 Mott Dipole Polarity might be wrong - [3286039](#)

- 9 7668-7671 Mott charge asymmetry vs DAQ mode study - [3286049](#)
- 9 7673-7684 Measurement of MFL0107 B-field - [3286084](#)
- 22 7685-7695 Tested/characterized cryo-unit at 4K - [3286878](#)