**Mott Commissioning Highlights (January 1, 2014 – May 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 asymemtries

**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 0L02 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**](https://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

**29 MOTTLOG created (all previous entries in POLOG)**

**30 DAQ upgrade done devweb.acc.jlab.org/CSUEApps/atlis/task/14092**

**May - August**

1. (Joe) Plot/Analyze Jan-Apr data
* Instrumental asymmetry summaries
* Effective Sherman function and rates for Au/Ag/Cu
* Effective Sherman function and rates for Au vs. KE
1. (Riad) DAQ readout rates
* Max rate in sampling mode
* Implement new semi-integrated w/ pedestal
* Block readout
* Discriminator thresholds
1. (Marty) Simulation
* “Finalize” full model
* Target physics generator
* Dump physics generator
* Benchmark/refine model to data
* Dry run set of simulations
1. (All) Planning for experiment run
* Quantify backgrounds from BeCu for Au
* Fold measured Seff and DAQ rate
* 4K option
* Prioritize measurements
* Targets
* Beamtime proposal