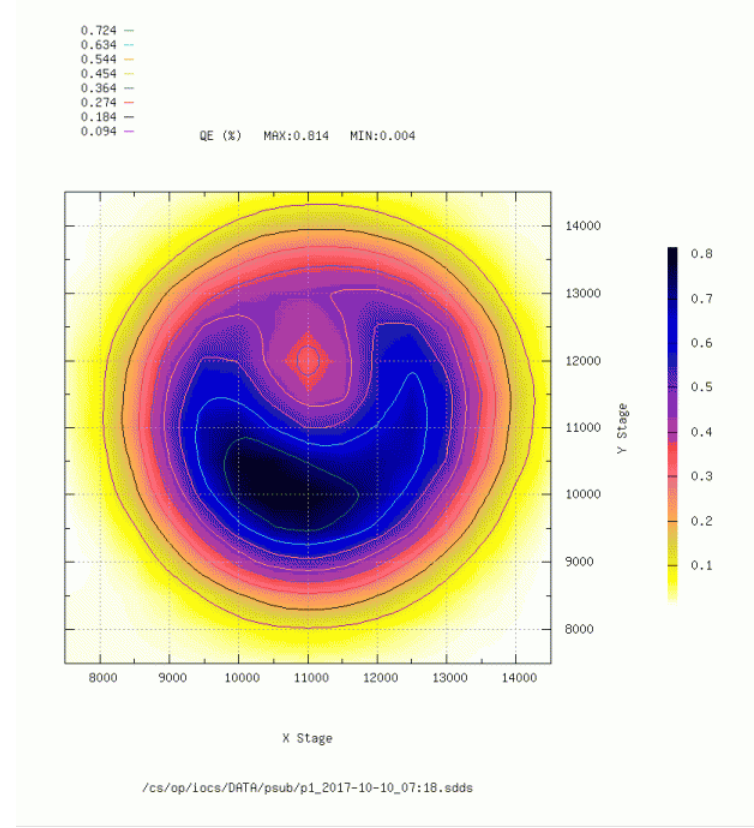
**The Past – Summer SAD 2017 (March – November)**

**Hardware**

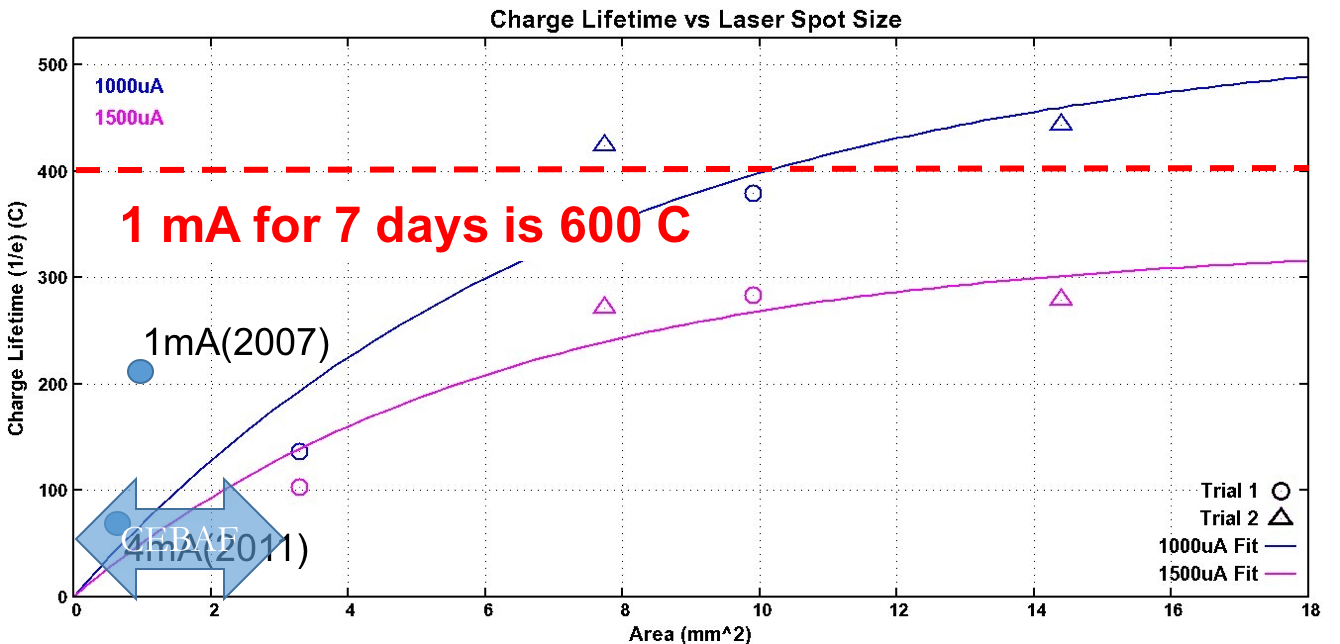
* 4-LLRF
  + Production unit installed (spare in fabrication)
  + Each laser has identical knobs (amplitude, phase shifter, 250/499)
  + FSD latch if RF system is confused on 250/499 => called RF group
* Laserfreek app
  + Tool changes laser rep rate between 250 and 499
  + Sequences the amplifiers ON/OFF while changing laser/RF setpoints
* Repair tune mode generators
  + DC mode for RTP cells backed out
  + Replaced two cells => bad extinction and bad tail
* Repair laser chiller
  + Good news, but local chiller worked fine all summer
* Removed Gun3
  + ALL Gun3 hooks removed and tested
  + VBV3I02 (a.k.a. Gun3 valve behaves like normal valve)
  + Vacuum diagnostic chamber there => will go away w/ new Y chamber
* Chopper amplifier replaced
  + I believe replaced w/ 300W spare unit (might be wrong)
* Suitcase-photocathode swaps
  + Many swaps, but this is what remains in Gun2
    - #9 - SLSP-5756-4 in HV (recent 12 GeV photocathode) – 10/10/17 activation
    - #3 - SLSP-5247-4 in Prep on SM#1-1 (QWeak sibling)
    - #6 - SLSP-75104 in Prep on SM#2-1 (90% photocathode, wet bake)
    - #10 - SLSP-DBR-75105-1 in Prep on SM#2-2 (DBR, wet bake)



**The Past – Summer SAD 2017 (March – November)**

**Beamware**

* Tested Brock cavity as a phase detector (like Yao) upstream of chopper
  + Test looked promising => useful for UITF
* Radio-isotope run @ 4K
  + Setup 15.7 MeV w/ 0L02+0L03 @ 4K
  + Injector ran well, bodes well if Bubble @ 4K
* PQB – dependence on laser size and divergence
  + Study sensitivity of pos. diff. to laser size at PC and Photocathode
  + Learned sensitivities to path length and similarity of divergence to set spot sizes
  + Instigated improved control of laser size/divergence and PPLN settings
* PQB – study KD\*P PC vs. RTP PC
  + Provide data to evaluate if RTP can be both a feedback for charge & position
  + Finally backed out, returned to standard KD\*P configuration
  + Instigated using Elegant to re-normalize pos. diff. results
* Installed resonant ring polarimeter
  + Installed in 1D beam line, ready for testing
  + If ring is limiting we can back out in few days with accesses, or over holiday
* Quad-Solenoid emittance study
  + Took solenoid-harp and quad-harp emittance data at various spot size
  + On Daniel’s plate to fit with provided equations
* mA polarization @ Mott
  + Measured polarizations remains high ~85% from 1 uA to 1 mA
* mA lifetime @ CEBAF
  + Operated up to 2 mA @ 499MHz to FC1
  + Measured lifetime vs. laser spot size => demo. >400C @ 1mA
  + Compared UHV and RadMon => fast loss detectable ~nA level



**The Present – Winter Run 2017-2018 (Dec 4th – Mar 21st)**

**Dec 4th – Dec 21st : 4 Hall Operations for three weeks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Hall A | Hall B | Hall C | Hall D |
| Program | E12-11-112 | Engineering | Commissioning | E12-06-102 |
| Passes | 2 | 5 | 3,4 | 5.5 |
| Current | 20 uA | 2-100 nA | 20,80 uA | Run: 150-200 nA  Tests: 5-600 nA |
| Polarization | No | Yes/Wien=TBD | No | No |
| Chopper/Slit | 499/A | 250/B | 499/C | 250/D |

**Jan 12th – 27th : 4 Halls Operations for two weeks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Hall A | Hall B | Hall C | Hall D |
| Program | **E12-10-103** | Engineering | **E12-06-107** | E12-06-102 |
| Passes | **5** | 5 | **4,5** | 5.5 |
| Current | 20 uA | 100 nA | 80,65 uA | 200 nA |
| Polarization | No | Yes/Wien=TBD | No | No |
| Chopper/Slit | **250/A** | 250/B | **499,250/C** | 250/D |

**Jan 27th – Feb 4th : 3 Hall Operations for one week**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Hall A | Hall B | Hall C | Hall D |
| Program | E12-10-103 | **Maintenance** | **E12-10-002**  **E12-10-008** | E12-06-102 |
| Passes | 5 |  | 5 | 5.5 |
| Current | 20 uA |  | 65 uA | 200 nA |
| Polarization | No |  | No | No |
| Chopper/Slit | 250/A |  | 250/C | 250/D |

**Feb 5th – Mar 22nd : 4 Hall Operations for six weeks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Hall A | Hall B | Hall C | Hall D |
| Program | E12-10-103 | **CLAS12 - Run Group A** | **E12-10-003**  **E12-10-017** | E12-06-102 |
| Passes | 5 | **5** | 5 | 5.5 |
| Current | 20 uA | **100 nA** | **70 uA** | 200 nA |
| Polarization | No | **Yes/Wien=TBD** | No | No |
| Chopper/Slit | 250/A | **250/B** | 250/C | 250/D |

**The Present – Winter Run 2017-2018 (Dec 4th – Mar 22st)**

**WEEK of Nov 6th –**

* Fri
  + Gun2 QE scan => same spot, new spot or heat/activate

**WEEK of Nov 13th – 4 Beam Setup to ILD**

* Mon-Tue to FC2
  + Wien Angle => looking at old 1050 setup, Yves is working B @ 5th pass
  + 4- bunch profile => benchmark ABCD @ 499 and 250
  + 4-laser phases => record ABCD phases @ 499 and 250 to save
  + 4-beam chopper
    - => determine atten/slit values for proposed currents
    - => measure bleed through
* Wed-Fri to ILD
  + Bunch length setup => status of tool and are there new settings ?
  + 0L-0R quad centering => update BPM offsets?
  + Injector match => important to test if new RF settings ?
  + high current setup => explore BD @ 250 & ABCD @ 250 ?
* What else ?
  + 750 MHz BPM detector
  + Managing expectations (halls have priorities)
  + Maybe put beam in the resonant cavity polarimeter on Tuesday…

**WEEK of Nov 20th – Week of Thanksgiving – no setup planned**

**WEEK of Nov 27th – CEBAF setup**

* CIS On-Call Support => Please send me your **un**availability through March 22nd

**WEEK of Dec 4th – Physics begins…**

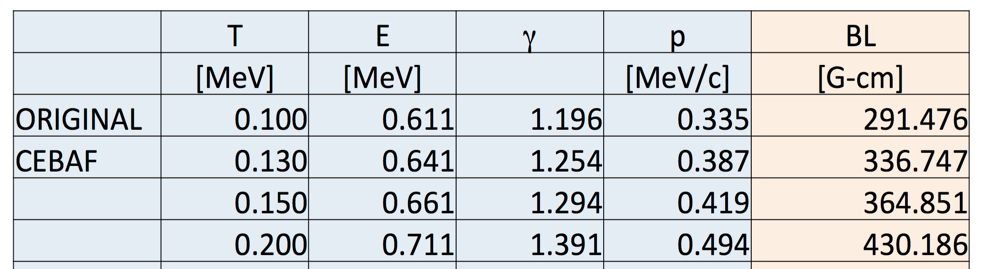
**Must – SAD 2018 (Mar 23rd – September 30th)**

**200 kV Gun Installation (integrated time is 2-3 weeks)**

* 200 kV HV chamber (R28 connector, excellent vacuum, no FE, reliable)
* NEG tube (two BPM’s + FH solenoid)
* 350 kV HVPS (SF6 tank, 350-R28 cable, resistor & short, ENG and software)

**200 kV Injector Testing (integrated time is 3-4 weeks)**

* Demonstrate HVPS safe and functional operation
* Demonstrate 200kV application to gun at CEBAF (no FE)
* Deliver 200keV beam from gun
* Evaluate existing beam line (magnets, diagnostics)
* Magnet currents increase by 28%



* Evaluate stability of new HVPS (may compare w/ present supply <150kV)
* Evaluate photocathode lifetime
* Assess range/performance of INJTWF (Wiens and solenoids)
* Assess chopper at higher power (Hovater)
* Assess chopping/dechopping with higher voltage beam
* Measure transmission/bunchlength vs. intensity/charge from 100-200kV
* Assess range of compatibility with existing ‘booster’ capture/quarter

**Bubble Experiment (integrated time is 5 weeks)**

* 1 week installation
* 2 week engineering run
* 2 week physics run

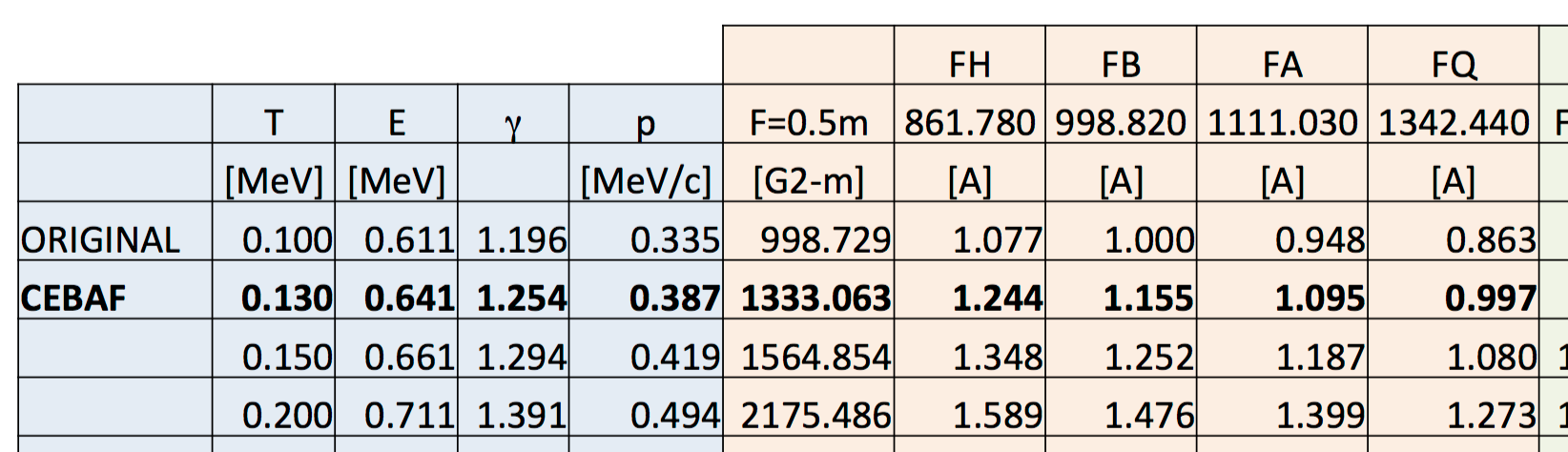
**Laser Table Jobs (integrated time 2 weeks)**

* STAC5 Upgrade
  + Replace 6 rotational steppers (attenA, attenB, attenC, attenD, RWP)
  + Replace 2 linear steppers + ADC (lensX, lensY, QE scan ADC)

**Stretch – SAD 2018 (Mar 23rd – September 30th)**

**Rebuild Baked Beamline for 200 kV Operation**

* MUST
  + repurpose as many components as possible
  + upgrade/fabricate those that cannot operate at 200kV
  + eliminate unnecessary or unused components (Brock cavity)
  + simplify setup where possible w/o loss of functionality (injsteer, PQB)
  + develop model to assess ME layout
  + coordinate w/ other groups that needs ~weeks for parallel upgrades !!!
* SHOULD
  + replace/fabricate components when obvious performance improvement
  + improve beamline vacuum
* **Installation (10-12 wks)**
* Disconnects and pull beam line out (1 wk)
* Break down and rebuild new beam line with survey as needed (2 wk)
* Install new beam line with 1A alignment (1 wk)
* Pumpdown, leak check, bake prep and bakeout (2-3 wks)
* Post bake leak check, hookups and HCO (2 wks)
* Beam line commissioning (2 wks)
* **Components**
* Fabricate new DS dipole magnet w/ AWG16 on DS fixture (need 3A)
* Existing transport solenoids should work (need to check MFG)



* Repurpose existing Wien filters
  + High voltage power supplies ordered
  + Existing feedthrough + barrel polished electrodes ready for UITF test
  + Modest vacuum chamber modifications are reasonable
  + Coil design needs to be improved (too many tight bends)

**Must & Stretch – SAD 2018 (Mar 23rd – September 30th)**

|  |  |  |  |
| --- | --- | --- | --- |
| 200kV Gun Capable | MAR | 26 | Bubble Install |
| APR | 2 | Bubble Engineering |
| 9 | Bubble Engineering |
| 16 | Install 200kV Gun / HVPS |
| 23 | Install 200kV Gun / HVPS |
| 30 | Install 200kV Gun / HVPS |
| MAY | 7 | Slop |
| 14 | Commission @ 200keV |
| 21 | Commission @ 200keV |
| 28 | Commission @ 200keV |
| JUN | 4 | Slop |
| 11 | Restore FC2 |
| 18 | Bubble Run @ 130 keV |
| 25 | Bubble Run @ 130 keV |
| Beamline Upgrade | JUL | 2 | Slop |
| 9 | Disconnect and pull beamline |
| 16 | Breakdown and rebuild |
| 22 | Breakdown and rebuild |
| 30 | Slop |
| AUG | 6 | Install and 1A |
| 13 | Pumpdown, leak check, bakeout |
| 20 | Pumpdown, leak check, bakeout |
| 27 | Slop |
| SEP | 3 | Hook-ups and HCO |
| 10 | Hook-ups and HCO |
| 17 | Commission |
| 24 | Commission |