Mott Gold Experiment Beam Time Request

Parameter	Unit	Part I: 499MHz calibration		Part 2: Precision Test		
Kinetic Energy	MeV	6.2	6.2	3.0	5.0	8.0
Bunch Frequency	MHz	31	499	31	31	31
Setup	Hour	8	0	8	8	8
Systematics	Hour	4	4	4	4	4
Foil Systematics	Hour	7	7	7	7	7
Foil Statistics	Hour	16	16	14	14	24
Time	Shift	4.4	3.4	4.1	4.1	5.4
Total Time (100% uptime)	Shift	7.8		13.6		
Total Time (87% uptime)	Shift	9.0 (3.0 days) e.g. Winter SAD 2015		15.6 (5.2 days) e.g. Summer SAD 2015		

Assumes:

- Beam current < 10uA
- DAQ rate up to 2 kHz
- dP/P < 0.25%
- Minimum run time /foil = 1 hour (stability requirement)
- Injector uptime = 87% (based on 6 weeks of PEPPo)

Run Time Justification

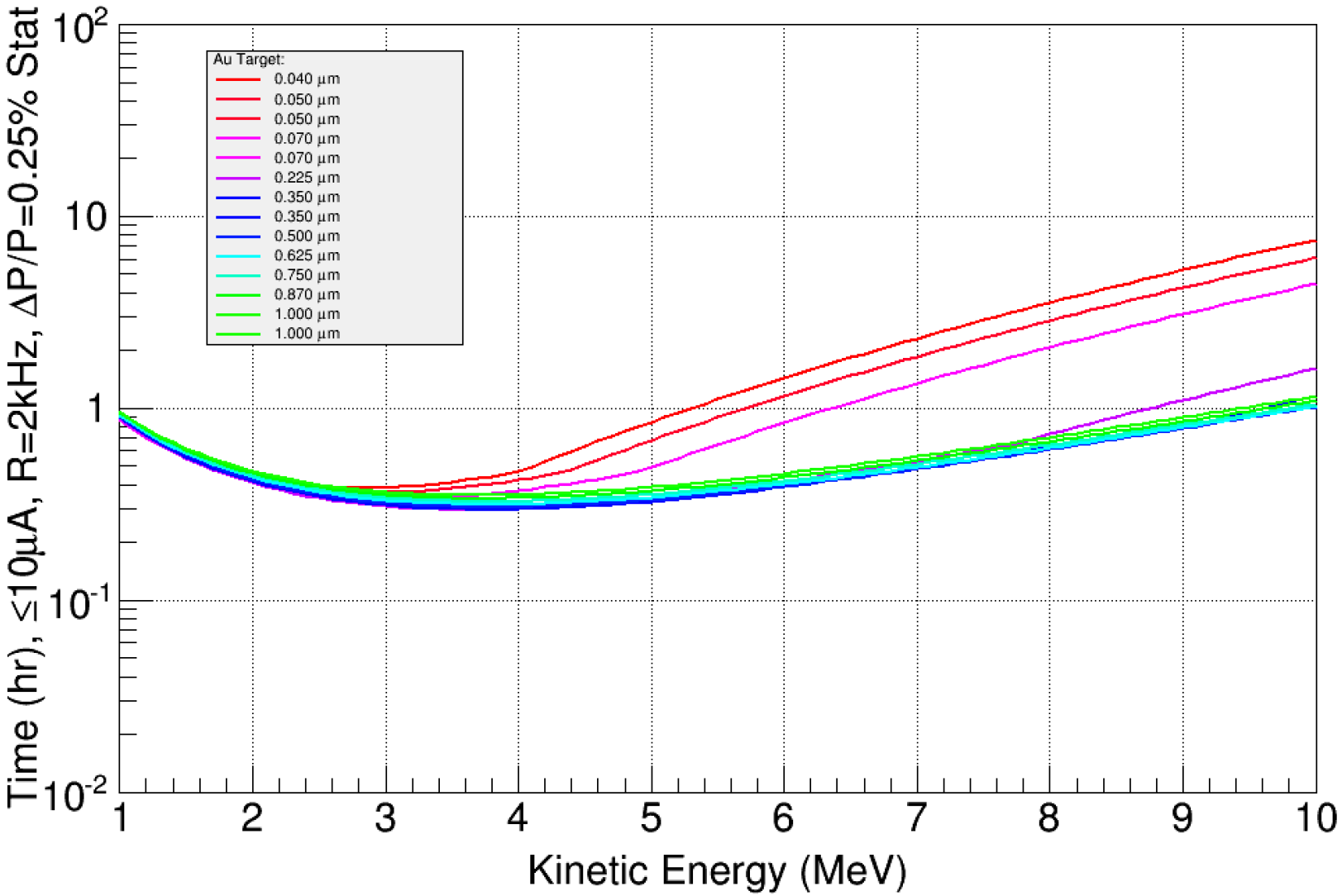
Experiment Run Time Estimate (per energy or beam rate configuration)

- Setup (1 shift)
  - ✧ Set and measure momentum, momentum spread
  - ✧ Set optics/beam size
  - ✧ BCM calibration

- Systematics (0.5 shift)
  - ✧ PMT HV gain check
  - ✧ Instrumental asymmetries vs. beam size, energy, position, intensity
  - ✧ Measure and minimize backgrounds

- Target Measurements (each of 14 foils)
  - ✧ 30 min for systematic checkout – may include full timing spectra
  - ✧ Statistical uncertainty 0.25% (assuming I<10uA, R<2kHz)

Run Time Statistics Calculation



Experiment Responsibilities

Beam Studies

- Suleiman: background suppression by FADC and TOF veto (ATLIS 14559, 4hrs)
- Grames: target positions & instrumental asymmetries (ATLIS 14558, 4hrs)
- Grames: demonstrate statistical stability for 0.05, 0.5, 1 um targets (ATLIS TBD, 4hrs)

Analysis & Tests

- Moser: add intensity into analysis calculations
- Mamun/Stutzman: target thickness measurements

Simulation & Theory

- McHugh/Opper: complete G4Mott model & simulate experiment
- Sinclair/Gay: work w/ Xavier and Charles to bound the Sherman function uncertainty

Proposing

- Grames/Poelker: Making the case for CEBAF beam time in 2015

Running

- Mott Team: staffing TBD based on schedule