

6/25/24

9:25 Ch 3K + 50mK RuO<sub>x</sub> are at 3K!  
 Looking good so I will start the regen.

12:05 Tried to start TES but serial arrays  
 were meosed up.

Solution: Turn off crate + Tower power supplies.  
 Stop regulator  
 Close heat switch  
 Turn off compressor  
 Wait until 10 K  
 Cool back down, reset

6/26/24

Trying to make new projectors using GUI

Run 0000 → Test  
 Run 0001 → No. sc  
 Run 0002 → Calibration Source

Run 0003

7/2/24

Added MKS gauge to calibration source,  
 pressure range of 1mTorr to 760 Torr (ATM)

Controller is MKS Type 116A Baratron

7/3/2024

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Pumped out dead volume region with pfeiffer vac.

-MVS reads 680 torr before and 679 torr after.

-Going to lunch ↴ 12:48

-Back from lunch ↴ 2:08, Moment of truth: Pressure ~~was~~ maintained ~~at~~ at 679 torr, window not broken



3:00

Pumped out dead volume, turned on calibration source pump. Slowly creaked open, valve keeping <sup>suckmaster</sup> closed.

Pressure slowly dropped to ~620 mTorr on external gauge while pump read  $\approx 10^{-8}$  (Torr?).

Turned on TES + Calibration source and lower energies (My K $\alpha$ , Al K $\alpha$ ) are now visible as expected.

We are going to close the gate valve to the dead volume so it does not vent if the turbo pump fails.

Happy 4th!

7/8/24

Testing gauge + testing for possible break in calibration source/dead volume window.

Turned off cal source pump, waited 10 minutes.

7/9/24  
4pm

Vented calibration source back to atmosphere. Now testing pressure gauge (which read 700 torr while connected) to test its validity.

7/11 Tested leak with leak detector and helium gas, slight flicker but no decrease. ~~the~~ Window may be intact ~~it~~ "

7/17 Tracing X-Ray source lines

Pwr → connected

Light → connected

Other Interlock → connected to TES Pirani Gauge

7/18/24 State A: roughly 4 hours of calibration w/ 10keV, 0.05 mA

calibration holder 1 (see page )  
Mg, Al, Si, Cl, K, Ti, Fe, Cu

State B: Took data at ➔ 12keV 0.1mA  
6:20 18keV 0.4mA  
6:35 18keV 0.6mA

With calibration holder 2 (see page )  
Mg, Al, Si, Cl, K, ~~Fe~~, Cu, Zn, Ge

7/19/24 State Start: 4 hours of calibration source 2  
18 keV 0.6mA

7/22/24 Run start! Wrote noise to 2024/07/22/0000

run 0001 + run 0002 are garbage

~~run 0003~~  
run 0003: Start A Calibration, 18keV 0.6mA

run 0004: Noise with EBIT conditions

run 0005: ~~start~~: Cal. 18keV 0.6mA  
A: w, ➔ 4KV 80mA

7/22/24

run 0006: start: Calibration 18 keV 0.02 mA  
cps  $\approx$  130

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Cut on for 1 min  
off for 4 min at an  
energy of 18 keV,  
current 0.025 mA

A:	W	<del>18</del> keV 3.96	80 mA	$\approx$ 40 minutes
B:	Bkg	4.0 keV	80mA	
C:	Re	<del>18</del> 4.16 keV	80 mA	
D:	Re	4.40 keV	81 mA	
E:	Re	4.68 keV	<del>80</del> 90 mA	
F:	Re	5.00 keV	90 mA	
G:	Re	5.30 keV	90 mA	
H:	Re	5.70 keV	90 mA	
I:	Re	6.00 keV	90 mA	
J:	Re	6.30 keV	90 mA	
K:	Re	6.6 keV	90 mA	

Note: I forgot to start a new state for  
Re 6.6 keV 90 mA; Will work with Galen  
to recover/Make a new state.

7/23/24 run 0000

start: Calibration holder 3 (Zn, Ge, Fe, (Sc, V, Mn, Lu),  
20 keV 0.04 mAA: ~~18~~ GarbageB: W 15.6 keV 65. mA } counts very  
varied Energy slightly  $\approx$  50 mEV } bad

C: W 4 keV + W 15.6 keV

D: W 15.6 keV 70.5 mA  $\rightarrow$  75.0 mA

Cal 1 min on 4 min off

~~18~~ keV 0.04 mA

E Re 16.00 keV 75 mA 7-10 cps/array

Cal on/off continued.

towards the end of E beam was @ 19 keV, 80 mA

19:12 pm

→ F Re 19.00 keV 90 mA 12-18 cps/array

20:39 pm G Os 20 keV 90 mA 20-29 cps/array  
(40 cps) max

22:30 stop collection, turn system off.

7/24/24

Run0000

10:12 AM

~~START~~

15 kV, 0.025 mA calibration holder 3

Note: Temporarily changed  
magnetism

20240723 Experiment state file to work!

11:40 A { Calibration 1 min on 4 min off  
20 keV 0.025 mA  
Os 4.3 keV 63 mA ~40 cps  
↳ 90 mA

3:49 B Ir 4.3 keV ~~8.6~~ mA ~70 cps

~ 5:00 C Calibration Holder 4 (

~ 5:16 D Fe 19.1 keV 100 mA  
cps initially 60, then dropped to 10

End of state D (first 30 seconds)  
contaminated with state E

6:46 E Re at 19.1 keV 90 mA

F

8:09

G Calibration with sample holder 3  
15 kV 0.04 mA

8:42

H Re 19 kV 111 mA

9:30 I Ir 19.1 keV 112.6 mA (20 cps)

210

↓  
Data started earlier;  
could alter state  
file to compensate.

Slightly contaminated with ~10 s of calibration  
at 9:35 P.M.

Afterwards normal calibration of 20 keV 0.04 mA  
for 1 min on, 4 min off

11:00 Shutting down EBIT, state stopped.

7/25/24

2:12 State START 15 keV 0.04 mA 270 CPS  
EBIT Voltages being forced

2:30 State A Os 4.37 keV 20 cps } ~~GATE~~  
85 mA } Gate value  
B Os 4.37 keV 180 cps was closed

Note 2:45 Bucking coil + E gun tripped, lost  
signal for a few minutes.

2:48 Started calibration on 1 min off for 4  
20 keV 0.025 mA  
stopped at 3:27

3:34 C Ir 4.54 keV 85.5 mA 40-50 cps  
(~50 later)

4:54 D Re 4.21 keV 85.2 mA ~40 cps

6:08 E W 4.06 keV 85.4 mA ~60-80 cps

8:08 F W 20.06 keV 101.1 mA ~25-30 cps

8:37 G Os 20.06 keV 125.1 mA

Note: 8:50 ish

10:17 I 20.06 keV 0.025 mA  
Calibration Holder 3

10:15 H Garbage

07/26

Start ~~was~~ was garbage

A Calibration 20 keV 0.025 mA

Calibration 1:20  
1 min on 4 min off  
20 kV 0.025 mA 1:40

B Os 4.38 keV 90 mA (180 cps)

C Os 4.38 keV 85 mA (160 cps)  
(fluctuated 40-160)  
50 cps

3:15

D Ir 4.38 keV 85 mA 50 cps

3:50

E Ir 4.38 keV 85 mA 50 cps

F Fe 20 keV 100 mA 8 cps

G Fe 4.37 keV 85 mA <sup>30</sup><sub>~40</sub> cps

5:15

H

5:30

I

5:44

J Fe 9.22 keV 110 mA

6:26

K Sample Holder 4  
Calibration 20 kV 0.025 mA

7:00

L Fe 9.22 keV 91 mA

7:40 MeVVA Firing rate

M 7:35 ~~calibration~~ calibration charged to  
20 keV 0.05 mA to help  
with drift correction