

2021 and 2024 Intensity Summary

IPTS 24916, 27957

James Rogers
jroger87@vols.utk.edu

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THE UNIVERSITY OF
TENNESSEE
KNOXVILLE

DEPARTMENT OF
PHYSICS & ASTRONOMY

Intensity at Magnet Position in 2021 Experiment

*LEM was not worth including here
because of unrealistically high countrate

Method:	Intensity [n/s]
GPM Propagation	$(9.22 \pm 0.06) \cdot 10^8$
Au Foil	$(7.403 \pm 0.756) \cdot 10^8$
Mean w/ RMS	$(8.31 \pm 0.92) \cdot 10^8$

Summary of analysis:

- 30% loss due to deadtime
- GPM countrate $(1.30 \pm 0.02) \cdot 10^5$ cps
 - $(18.7 \pm 1.1)\%$ McStas simulated Transmission from GPM to Magnet
 - $(90.8\%)^2$ transmission through sapphire and Si windows, from Mubi Calculation
- $\eta' = 3.108 \pm 0.006) \cdot 10^{-5}$ counts / neutron

Gold Foil calculation:

- $(2.04 \pm 0.05) \cdot 10^8$ n/cm²/s
- (3.629 ± 0.36) cm² (**completely arbitrary error)
 - intensity = $(7.403 \pm 0.756) \cdot 10^8$ n/cm²/s

→ 11% rel error
(from difference of GPM,
Au Foil measurements)

Intensity at Magnet Position in 2024 Experiment

Method:	Intensity [n/s]
GPM Propagation	$(6.29 \pm 0.42) \cdot 10^8$
LEM Measurement	$(6.05 \pm 0.18) \cdot 10^8$
Mean w/ RMS	$(6.17 \pm 0.12) \cdot 10^8$

→ 2% rel error
(from difference of GPM,
LEM measurements)

Summary of analysis:

- 15% loss due to deadtime
- GPM countrate $(1.107 \pm 0.036) \cdot 10^5$ cps
 - $(18.7 \pm 1.1)\%$ McStas simulated Transmission from GPM to Magnet
 - $(90.8\%)^2$ transmission through sapphire and Si windows, from Mubi Calculation
- $\eta' = 3.108 \pm 0.006) \cdot 10^{-5}$ counts / neutron

LEM Measurement:

- Countrate with deadtime correction:
 $(1.866 \pm 0.055) \cdot 10^4$ cps
- Spectral efficiency:
 $\eta' = (3.085 \pm 0.009) \cdot 10^{-5}$ counts / neutron

Questions?
jroger87@vols.utk.edu



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Gold Foil Error estimation

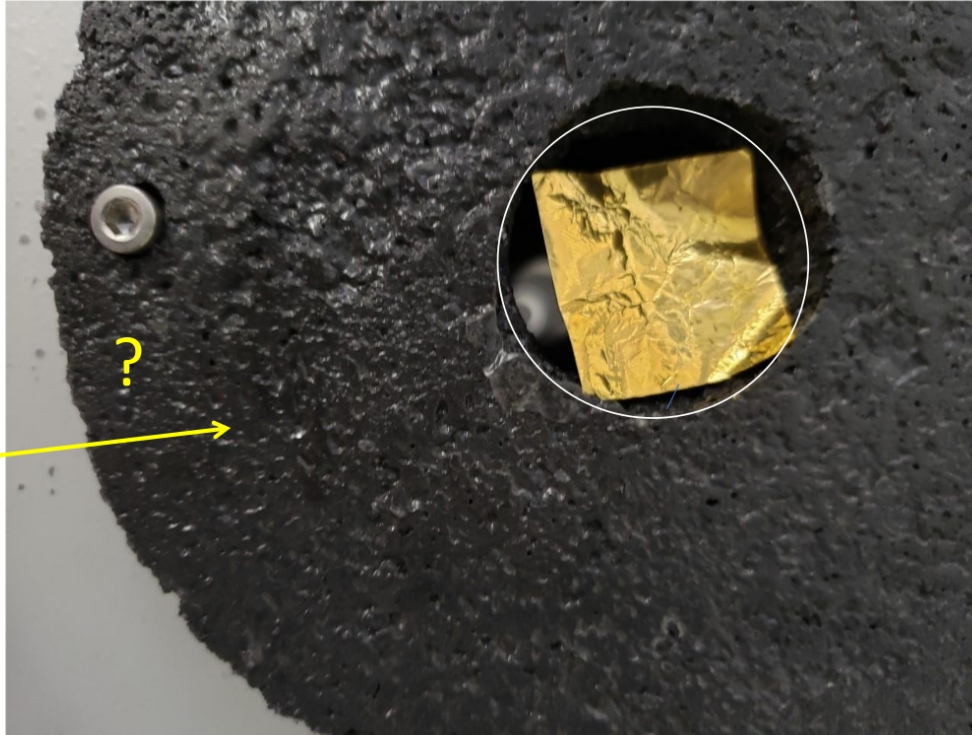
Gold foil

mass 103.3 mg

Foil area ?

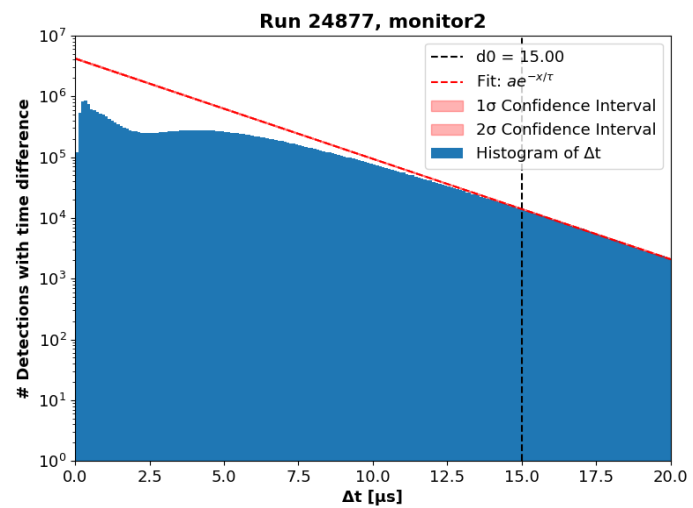
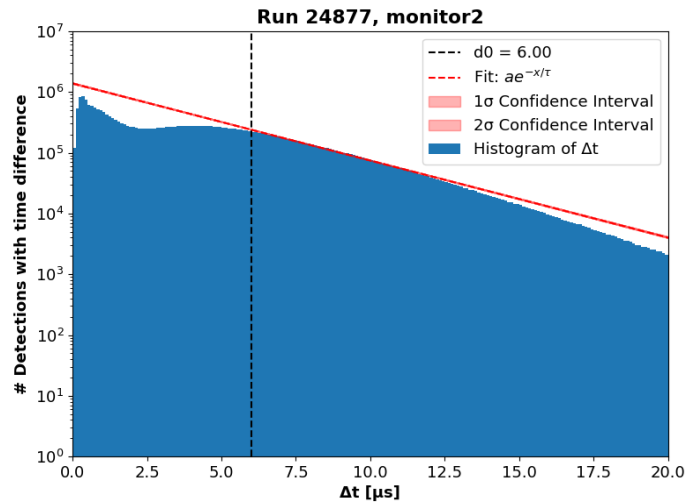
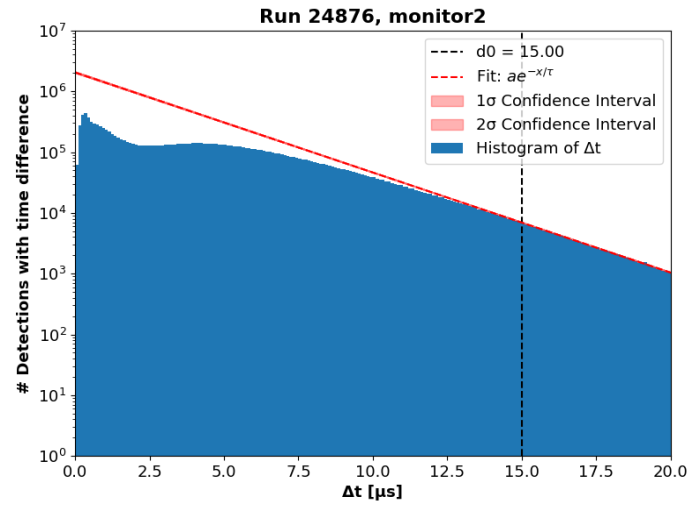
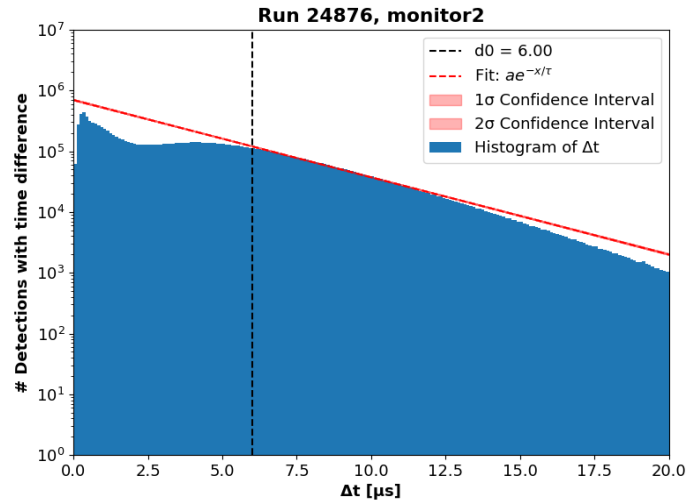
$\frac{3}{4}'' \times \frac{3}{4}''$

Then thickness $14.73 \mu m$?



- Gold foil area estimation is difficult due to improper placement
- Assume 10% error on area estimation

LEM 2021



LEM Shows Extreme Counting Rate in 2021 Experiment

Run:	Original counts	d=6us	d=15us
24876 (61s)	1.3952502e7 c	2.3755555e7 c	5.3907428e7 c
24877 (123s)	2.7716026e7 c	4.7226189e7 c	11.0063308e7 c
AVG rate	2.27032e5 cps	3.86694e5 cps	8.89276e5 cps
Correction ratio avg	1	1.70	3.9
I (est) n/s	7.35922e9	1.25347e10	2.8825e10

Deadtime corrected count rate is 3.86694e5 cps (trusting the low dt slope), or if you consider the range between different deadtime estimates, (6.37985e5 +- 2.51291 cps)

Divide by $\eta' = (3.085 \pm 0.009) \cdot 10^{-5}$ counts / neutron to get estimated intensity

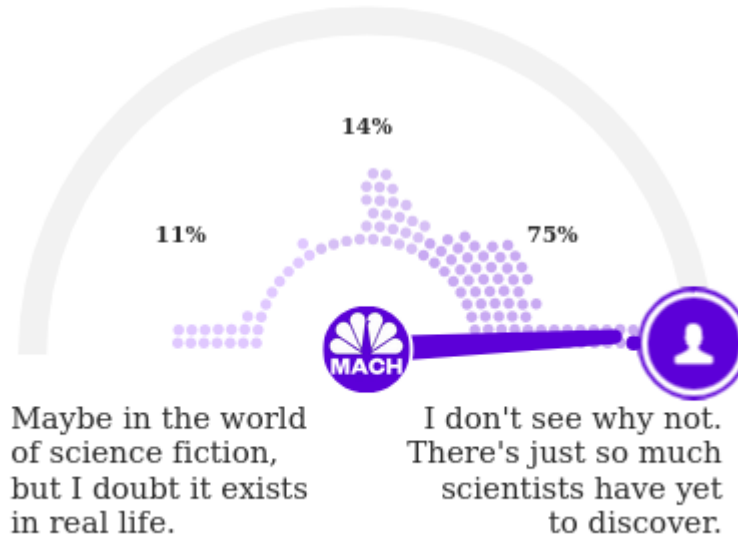
→ 2.068e10 n/s (insane prediction)

Popular Opinion Towards Feasibility of Mirror Matter

QUICK VOTE ● 28,544 VOTES

Do you think a mirror version of our universe might exist?

You have a strong view.



- Definitely a biased sample of the population, but if the graph is interpreted as histogram then it seems to suggest high confidence in mirror matter feasibility
- Unclear what the percentages represent
- Ignore the marker at the “full believer” side, you have to vote to see the results