# Tentative Agenda

| | | | |
|---|---|---|---|
| 1. | Yuri | 10' | Status of nTMM-2 preparation at GP-SANS |
| 2. | Yuri | 15' | Beam time program for nTMM-2 at GP-SANS for Sept 8-12 |
| 3. | Alina | 10' | On-line analysis organization |
| 4. | Carolyn & Alina | 5' | 20 min vs 30 min runs ? |
| 5. | Shaun | 5' | Pressure monitoring with video camera |
| 6. | Mubi | 10' | COMSOL simulations for mu-prototype |

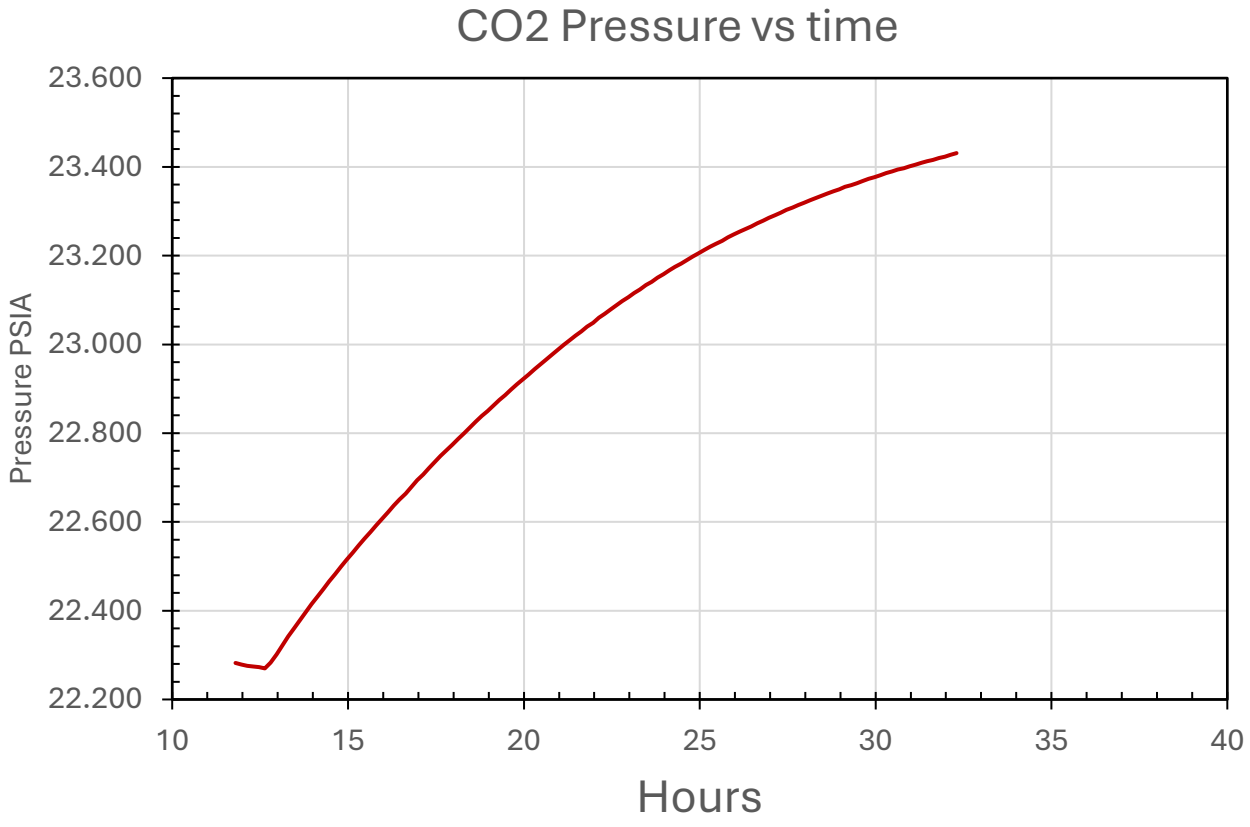
* please, send me all your slides for INDICO posting

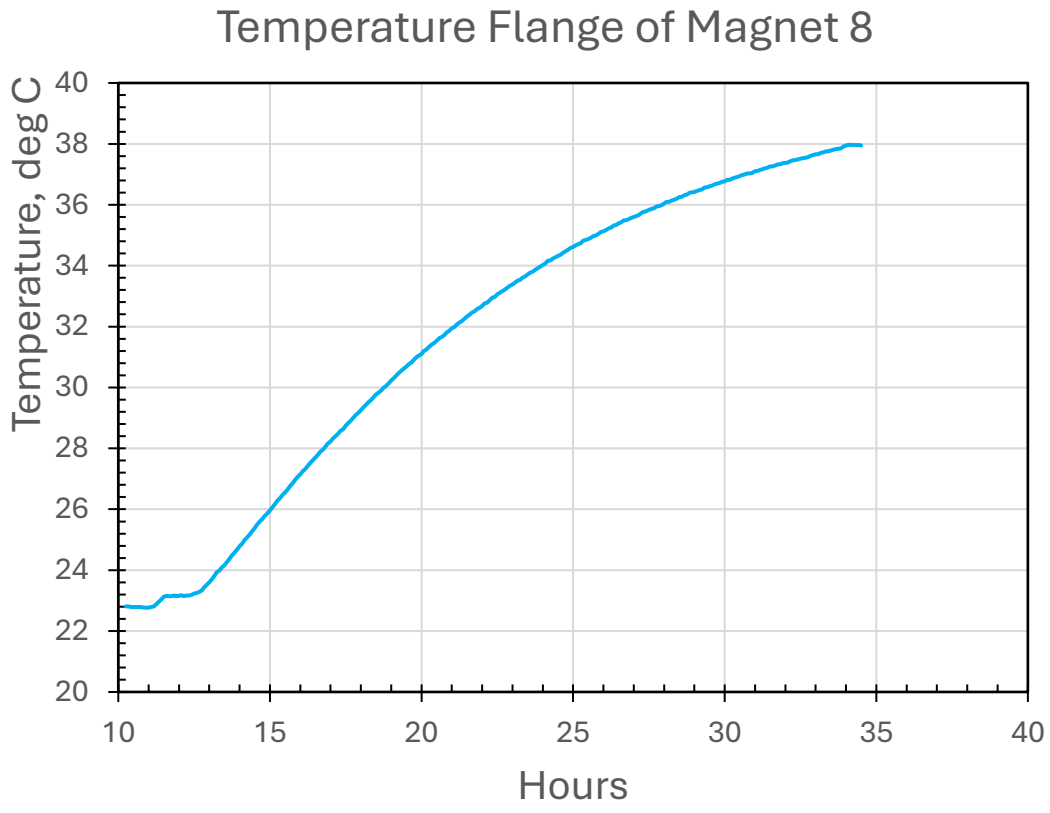
# Beam time September 8-12 run program IPTS Proposal 37490.1

Note, Monday September 7 is Labor Day. No access to GP-SANS

Yuri Kamyshkov

# Current operation of two magnets at GP-SANS with current 0.33 A




Goal to come to stable equilibrium temperature for beginning of measurements

# Unresolved issues that we have

- Plans of ICE magnet operation at CG-4: no clear plans.
- If they will change magnetic field very often, we will need to degauss after every change. Each degaussing procedure will take ~ 1 hour of our time.

(1)

- ❖ Likely that they will do most changes during first day.
- ❖ They essentially have gamma detector. Its operation might be severely hindered by gamma background of our beam absorber.

- Lisa will be talking more with ICE people.
- We will have our shift access view to ICE current status
- We plan to install + 2 outside magnetometers between GP-SaNS and Bio-SANS guide boxes to record the history of ICE filed variation (for OFF LINE)

(2)

- Magnetometers readout ~ 1 per sec exists in NEXUS files. All of it is not transferred to .TXT files. Lost in translation (Matt)

(3)

- On Friday September 4 by 4:00 PM Lisa will produce 2-3 dry runs to check the format of output files.

# nTMM parameters (preliminary)

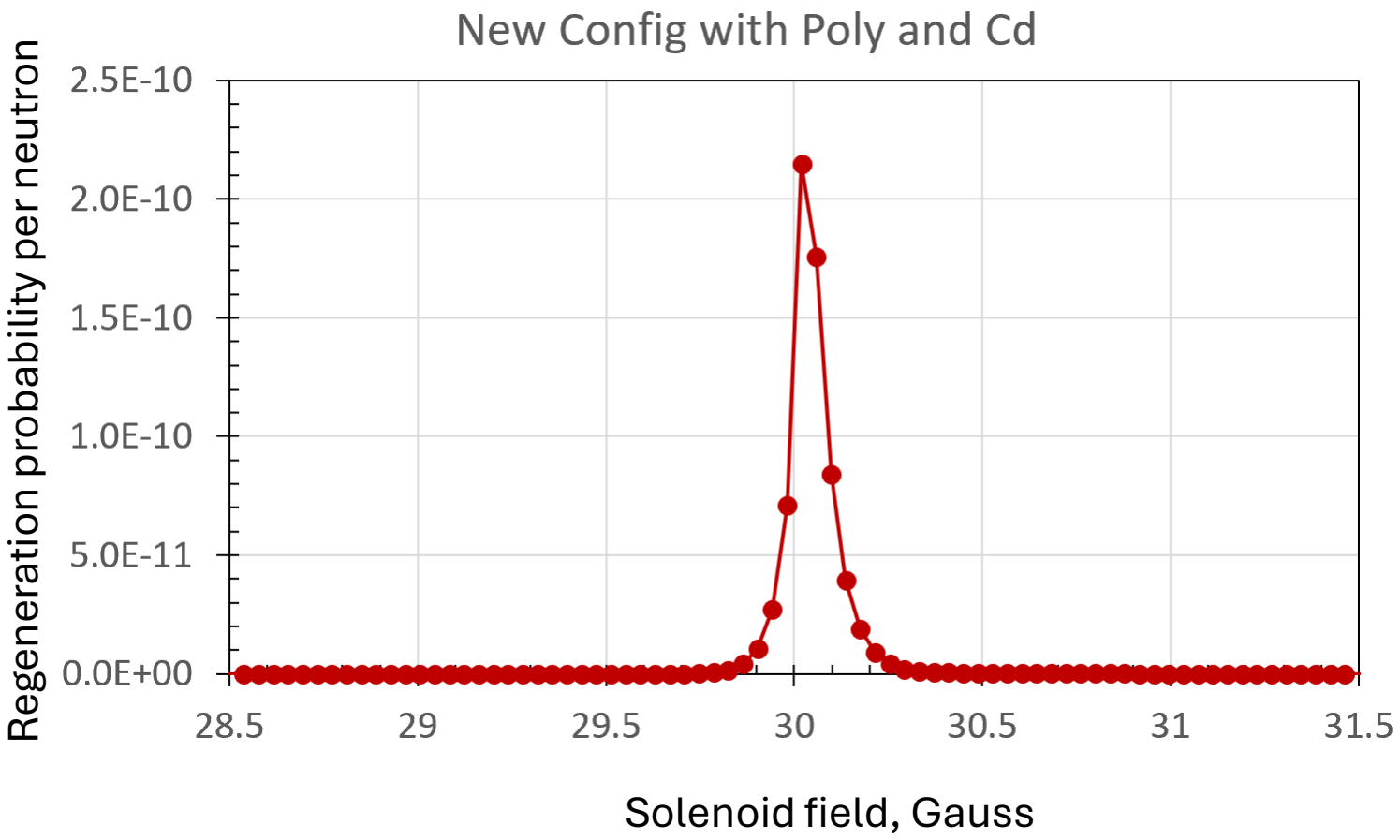
| | |
|---|---|
| $CO_2$ Pressure (8/25/2026) | 22.314 psia |
| At Temperature | 21.8 °C |
| $CO_2$ gas density (NIST) | 0.0027831 g/cm$^3$ |

https://webbook.nist.gov/cgi/fluid.cgi?ID=C124389&TUnit=C&PUnit=psia&DUnit=g%2Fml&HUnit=kJ%2Fmol&WUnit=m%2Fs&VisUnit=uPa*s&STUnit=N%2Fm&Type=IsoTherm&RefState=DEF&Action=Page

| | |
|---|---|
| Optical (Fermi) potential $V_F$ | 1.81E-10 eV |
| W absorption & scattering | 1.0698E-17 eV |
| B_at peak (from $V_F = \mu B$) | 30.02 G (Gauss) |
| $\mu$ neutron magnetic moment | 6.03E-12 eV/G |
| Gauss= 97.5 * Current (A) | COMSOL calc. (Linus) |
| Coil Current at peak= | 0.3079 A |

* These numbers will be modified for final temperature and presure

# Sensitivity calculation




n-intensity is ~ 5E+12 for 30 min
Peak count 1,100 for 30 min

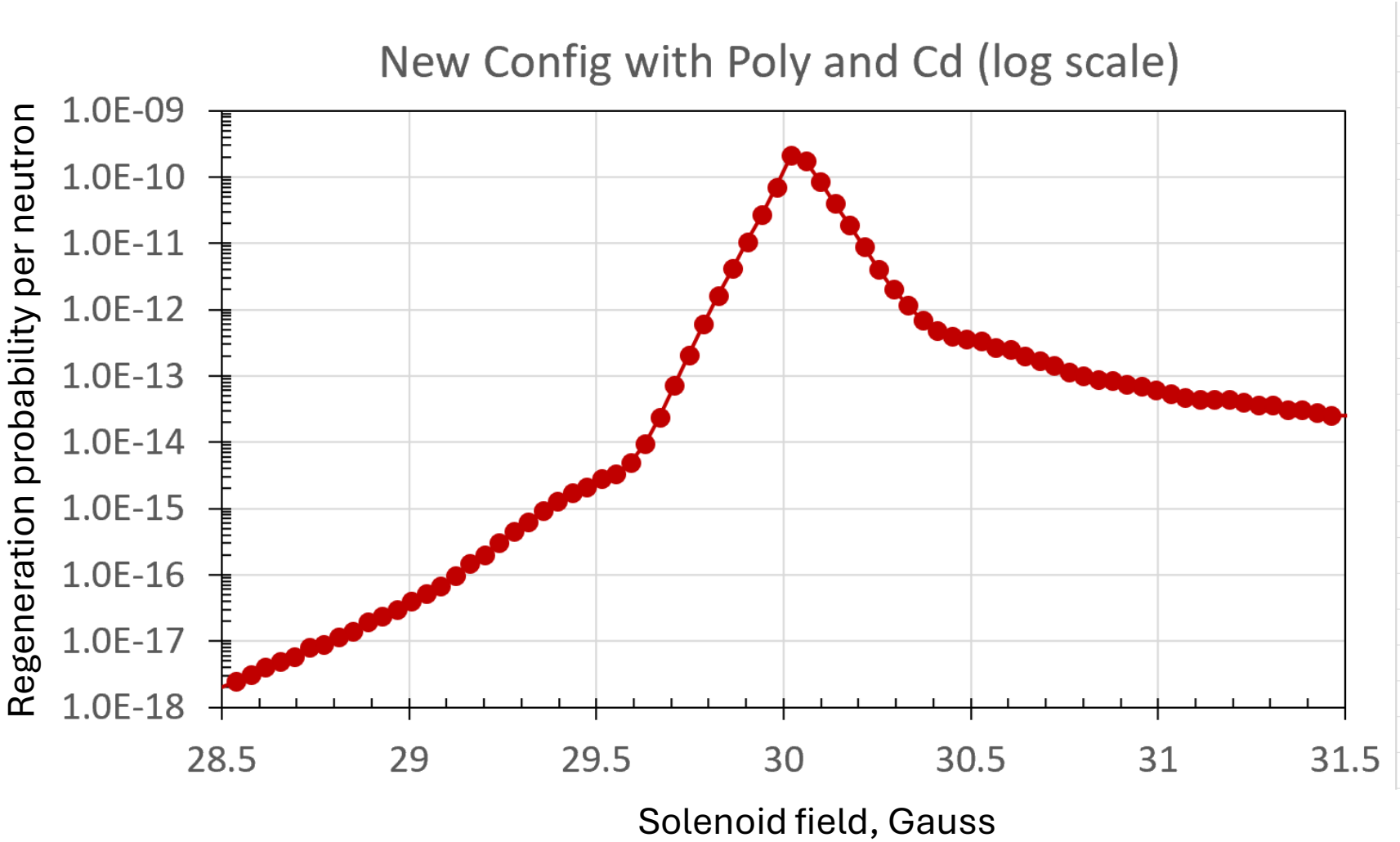
Step $\Delta B$ =0.039 G
Peak current = 0.3079
Step current $\Delta I$=0.0004 A

Suppose, we take 81 measurements
by 30 min per measurement
From I = 0.2919 A
to I = 0.3239 A

It will take 40.5 hours
and measures $\pm 1.56$ Gauss around central

$\boldsymbol{\kappa = 5 \times 10^{-6}}$ sensitivity ×88 higher than in 2025 run
Pressure 22.314 psia at 21.8 deg C

Probability is averaged over 2-20 Å spectrum with 2000 samples



# Suggested scenario for Sept 8-12 run

Assuming that ICE magnet will be at constant field (0T or 5 T no variation)

**Before beam time**

| | |
|---|---|
| 1 hour | Degaussing of both magnets at max current 0.33 A planned for Wednesday Sept 2 |
| 1 week | watch for max temperature of coil (going on) |
| 1 hour | Degaussing of both magnets at max current 0.33 A Early Tuesday September 8 |

**During beam time**

| | |
|---|---|
| 4 hours | reactor commissioning |
| 1.5 hours | checking detector background, GP monitor, and data quality |
| 40.5 hours | 81 points 30 min sequential scan from I = 0.3239 A , step 0.0004 A, down to I = 0.2918 A |
| 1.5 hours | change magnets polarity. Degaussing of both magnets at max current –0.33 A |
| 40.5 hours | 81 points 30 min random scan between I = 0.3239 A and I = 0.2918 A (same points) |
| 8 hours | reserve (1-hour scans near point 0.3079 A ~ 30.02 Gauss) for more precision of nTMM determination |

# Change of magnets polarity for the possibility of analysis in terms of mirror magnetic field

Probabilities per one magnet flight

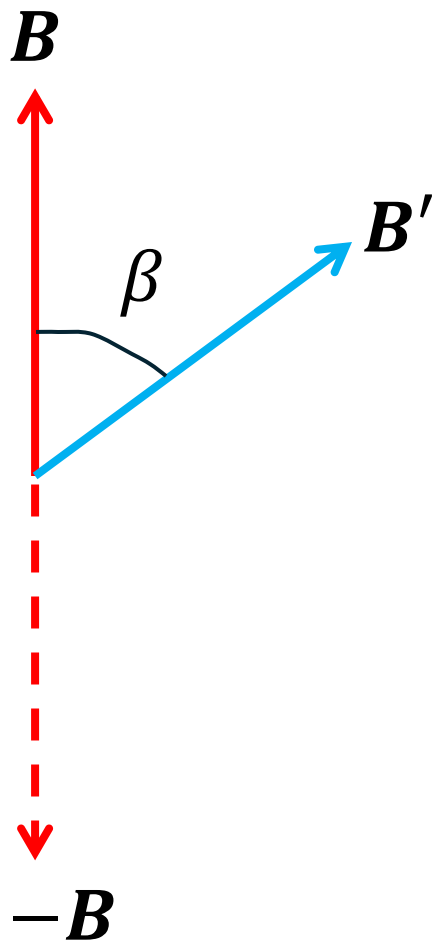
$$P_{\boldsymbol{B}}(t) = \mathcal{P}_B(t) + \mathcal{D}_{\boldsymbol{B}}(t) = \mathcal{P}_B(t) + D_B(t)\cos\beta,$$

where $\beta$ is the angle between the vectors $\boldsymbol{B}$ and $\boldsymbol{B}'$ and

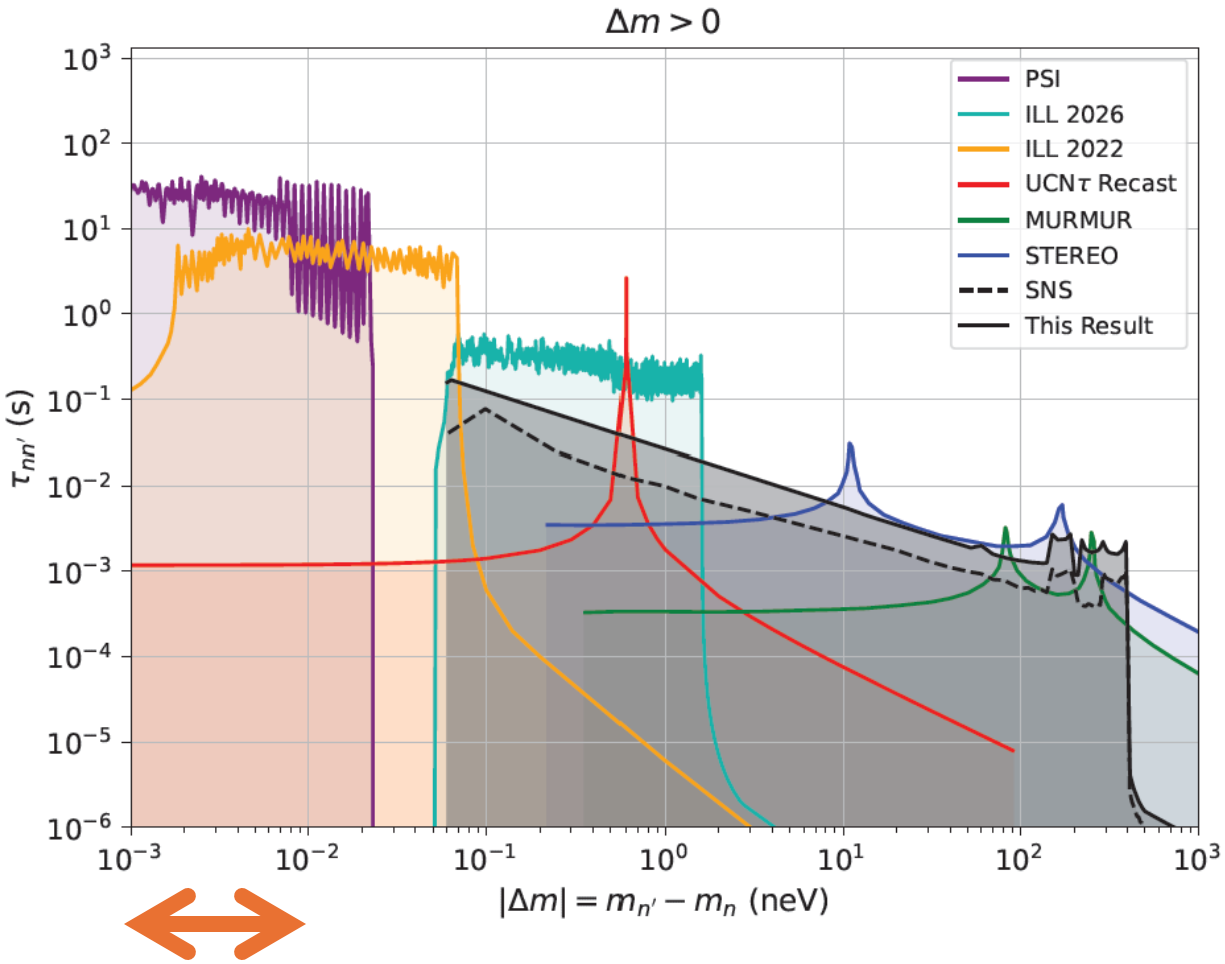
$$\mathcal{P}_B(t) = \frac{\sin^2[(\omega-\omega')t]}{2\tau^2(\omega-\omega')^2} + \frac{\sin^2[(\omega+\omega')t]}{2\tau^2(\omega+\omega')^2},$$

$$D_B(t) = \frac{\sin^2[(\omega-\omega')t]}{2\tau^2(\omega-\omega')^2} - \frac{\sin^2[(\omega+\omega')t]}{2\tau^2(\omega+\omega')^2},$$

$P_{\boldsymbol{B}} + P_{-\boldsymbol{B}} = 2\mathcal{P}_{\boldsymbol{B}}$ is not function of $\beta$



- Should we have 20 min runs and cover more $\Delta B$ ?
- Should we make current step 0.0005? $\Delta B = 0.04875$ ?

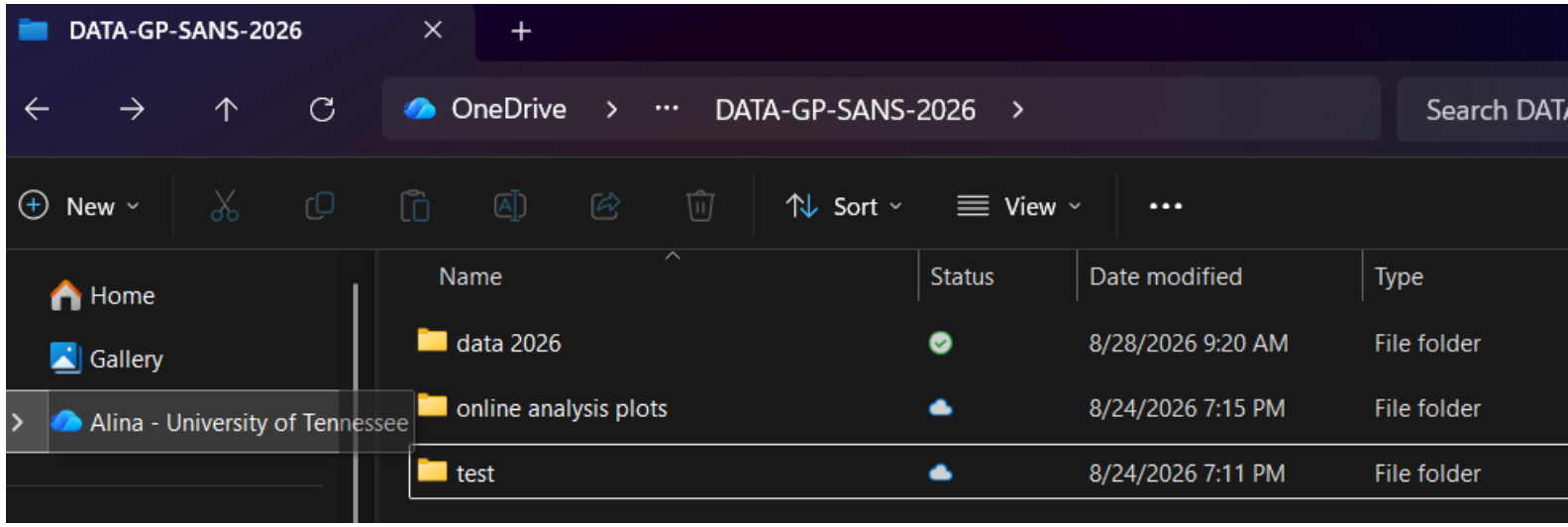


# Online analysis updates 9/1

Alina Moore  09/01/2026

# No more rclone

- Can sync directly to the OneDrive folder from my computer with the OneDrive app.
- Simpler for what we need




# Hosting and storage

- All online, on google cloud
- App will be available with a link and run whenever you open it
- Link can be posted in a file on onedrive and distributed like any other website link

Google Cloud Run

# Where the data and downloadables go

- Run Nathan's script – translate h5 to txt and save to my laptop
  - Immediately after, upload to Google Cloud storage bucket for the app to use
  - Put files in the OneDrive folder for others to access
    - these happen in the same step after replacing Nathan's original rclone logic in process-data.sh file
  - Scheduled to happen every 30 mins

- App sees new files in the cloud storage bucket and will include them in the analysis
  - Can possibly save counts plot and latest 2D hist to cloud storage bucket, read from it, and save the plots to the UT OneDrive folder as well
  - Everything downloadable from UI as well

# Currently doing

- Get conversion.py script to see and operate on runs. Needs done by Friday
  - Syncing things from the processed data folder on ornl server works, just need to generate the txt files to populate that folder
- Playing with the UI – feedback on visuals ?
- Adjusting code for the cloud.

# TBD

- Add readout pngs to UI ? Ideal, but how to do that?
  - Cloud storage bucket does support pngs. Seems possible to add them
- Start scheduled task for getting new run files. Test on Friday with dry runs.
- Deploy to google cloud on Monday. Post to GitHub also

# Other things (added after Tuesday meeting)

- We have off on labor day so I have a whole day to work on this and update people on things
- Likely getting a desktop computer for school this weekend, means there will be no issue with sacrificing my personal laptop to perform the scheduled task for 4 days.

# 20’ vs 30’ Run Limits (2025 data)

Carolyn Haviland, UTK, 9/1/2026

# Limits

**20 minutes:** $\boldsymbol{\kappa < 6.83 \times 10^{-6}}$

**30 minutes:** $\boldsymbol{\kappa < 6.52 \times 10^{-6}}$

- I don't know what constitutes close but these seem close to me

September 1, 2026

# Limits from 20 and 30 min runs for 2025 data

Alina Moore

From experimental data:

30 mins: $\kappa < 6.205\text{E-}6$

20 mins: $\kappa < 6.843\text{E-}6$