

UT group plans

Yuri Kamyshkov
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Devyn Powers – graduated from UT in December.

Will stay with us to finish his contribution to 2020 SNS data analysis.

His activity:

- Analysis of high-statistics simulated (L.H.) data for beam attenuation in PC.
 - Correction for intensity at zero attenuation from simulated 18,19,20,21,22,24 points.
 - Correction for scattered background in intensity measurements from simulation.
 - Finding final intensity points and errors from measured 18,19,20,21,22,24 points.
 - To be delivered: final zero attenuation intensity correction and error
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- State of progress ~ 80%
 - Goal to finish within ~ a month
 - Will be used in new paper

Kanan Wise – sophomore

Simulations and configuration and n TMM ($\Delta m = 0$) in air experiment for GP-SANS

His Activity:

- 10 Gauss Magnetic field resonance curve for GP-SANS spectrum
 - Accounting of mag. field non-uniformity on resonance width
 - Beam through the magnet simulation with Lisa's McStas at sample position
 - Configuration of magnet (diameter)
 - Evolution of beam propagation through Cd absorber and regeneration effect
 - Demonstration of sensitivity at $\eta < 10^{-5}\mu$
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- Current state of progress $\sim 20\%$
 - Contribute to the next GP-SANS experiment (planned for 2024)

James Rogers – freshman

1. Finished analysis of GP-SANS 2021 “radioactive” data.
Second independent analysis to be performed by somebody.
2. His Current Activity (at the beginning)
 - Simulation of beam-experiment configuration for HIBEAM at ESS
 - Learning McStas
 - Calculation of sensitivities of nn' and $n\bar{n}$ HIBEAM experiments
 - Contribution to ESS -TN Collaboration effort

"Hakanson, Josie" <bhakans1@vols.utk.edu>

Josie Hakanson – freshman

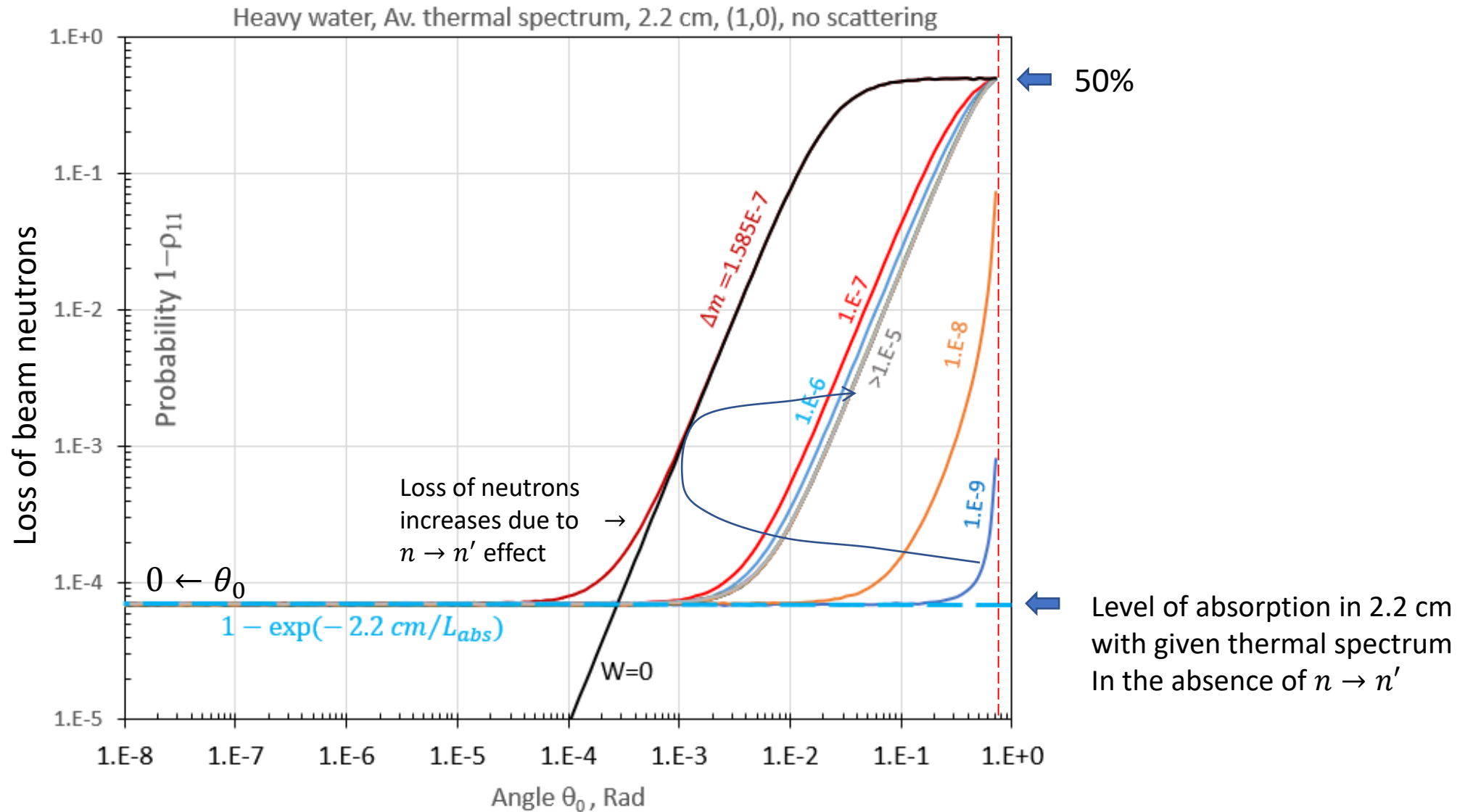
Her Current Activity (at the beginning)

- Study by evolution calculation UCN wall reflection effect as LZ transition
- Study the magnetic field gradient as LZ transition in the separation of n and n' wave packets
- Theory of QM measurement development

Cary Rock – GRA

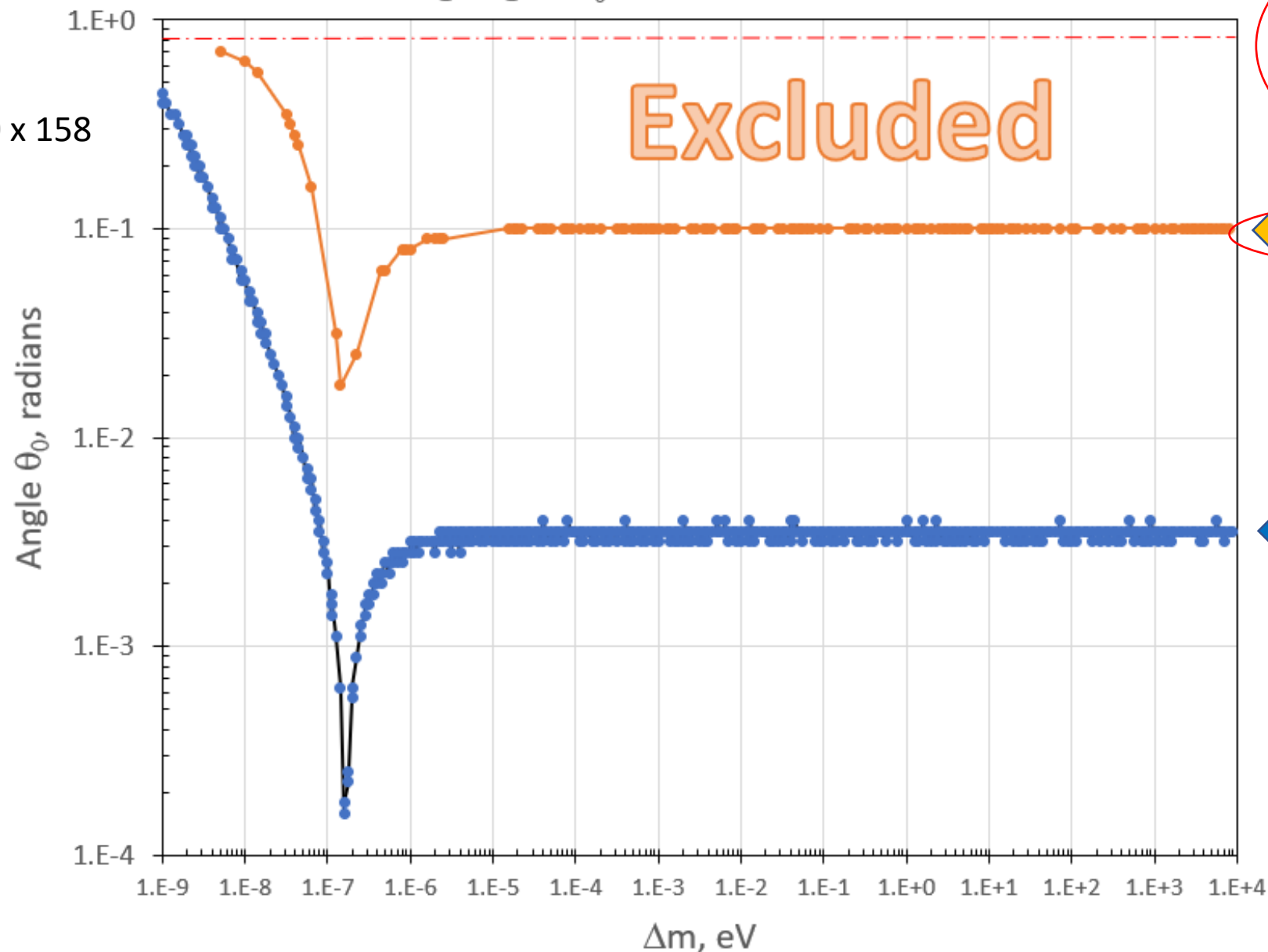
1. Exclude large θ_0 mixing angles from known D2O absorption x-sections
 - State of progress $\sim 90\%$.
 - Goal to finish in few weeks
 - Needed for discussion of STEREO paper

Calculation for single 2.2 cm layer of D2O to exclude large mixing angle



From known thermal absorption in 2.2 cm of heavy water
the mixing angles θ_0 above the line can be excluded

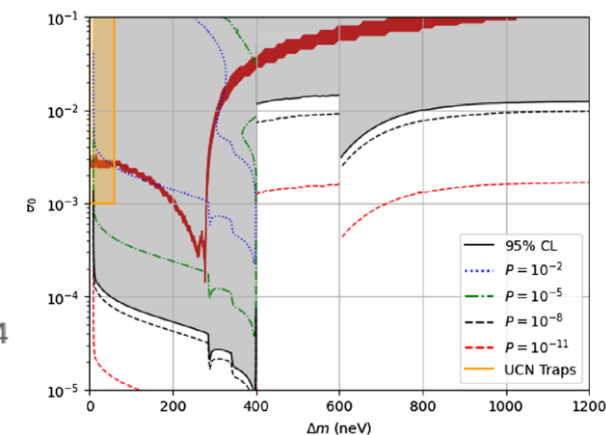
Table 260 x 158



Cary can repeat this
for 105 cm layer of D_2O
with 124 scatterings
included and claim that
e.g., 10% effect is excluded.

If 2% loss of flux

If loss not exceeds $\sim 10^{-4}$
within 10% accuracy of
absorption x-section.



Cary Rock – GRA

2. Rechecking calculations through ILL reactor- STEREO detector system

- State of progress $\sim 80\%$.
- Goal to finish within few weeks
- Needed for PRD paper for discussion of competition with STEREO
- Will generate the 260×158 table of regeneration probability for Δm in the range 1 neV – 10 keV and (260 points)
for θ_0 from 10^{-8} rad up to max $\pi/4$ rad (158 points)

Yuri Kamyshkov

- I will teach Electricity and Magnetism for Engineers (60 students)
MWF from 11:30 to 12:20
M from 3:30 to 5:00 Physics Colloquium (attending)
W from 3:00 to 4:30 Particle and Cosmology Seminar (attending)
- January 9 – 18 trip to ESS
January 12-13 at ESS/LUND
NNBAR/HIBEAM General Meeting
<https://indico.esss.lu.se/event/3129/timetable/#20230112>

To:Kamyshkov, Yuri

Fri 12/23/2022 5:38 PM

Hi Yuri,

The NE department is going to keep twelve 2'x3' sheets of Cd that we had across the river. Wes Hines said I can use as much of that as I want. I don't know how thick the sheets are, but I'll find out once they bring them to our building.

Regards,

Lawrence Heilbronn

John D. Tickle Professor

Nuclear Engineering Department

University of Tennessee, Knoxville

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