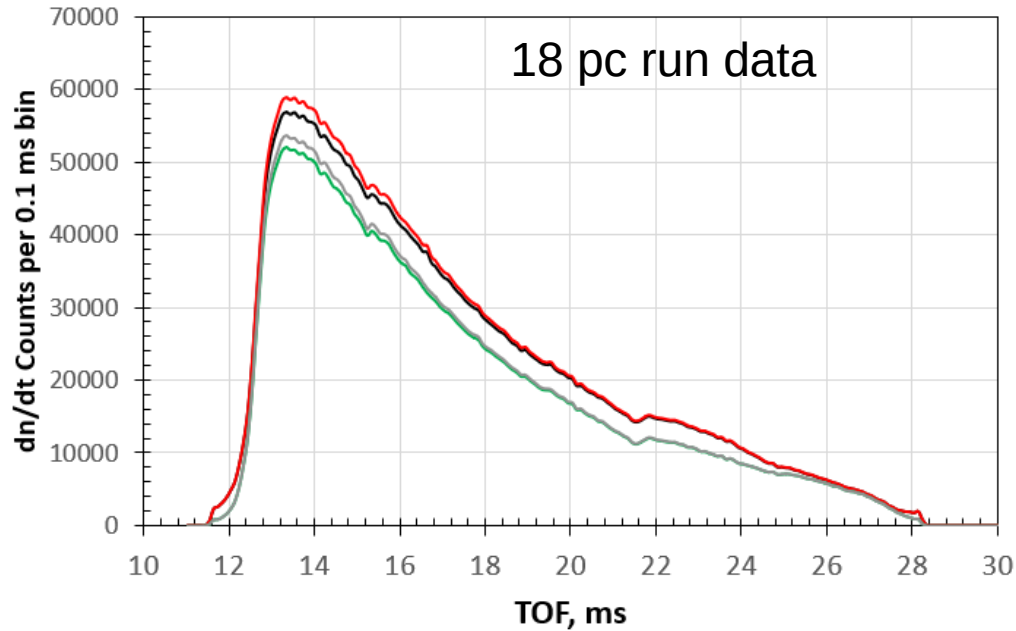


Update On SNS 2020 Figures

UT-ORNL n-n' Group Meeting
2/1/2024
Cary Rock

New Dead Time Correction (tribute to Erik).
 For intensity calibration for runs with 18-24 pc
 Selected frames with $Q_p > 23$ uC

$$f_{DT} = \left[1 - \tau_{DT} \cdot \frac{dn}{dt} / \#_{frames} \right]^{-1}$$



Black – No selection cuts, no DT correction ← used for f_{DT}
 Red – No selection cuts, with DT correction
 Green – in ROI selection, no DT corr.
 Gray – in ROI selection, with DT corr.

Correction integrated over TOF spectrum

Differential Dead Time Correction of total counts per RUN						
in ROI for 18-24 PC	18 PC	19 PC	20 PC	21 PC	22 pC	24 PC
No D.T. Correction	3,278,169	2,172,532	1,495,510	1,009,855	705,327	349,808
With D.T. Correction	3,344,059	2,203,857	1,511,082	1,017,536	709,382	351,012
correction effect	1.020099615	1.0144188	1.010412338	1.007605923	1.00574872	1.00344151

Old DT correction method used TOF-integrated intensity numbers

Suggestion: Recalculating Deadtime Correction

- Dr. Iverson mentioned verifying that a more sophisticated method of determining deadtime would not significantly alter the results.
- YK did this determination, I reran the fitting for both 5-PC and 6-PC.

Old:

F0: 2.4962 +/- 0.003384
Eta: 0.666924 +/- 0.000602
Chi2: 1.554

New:

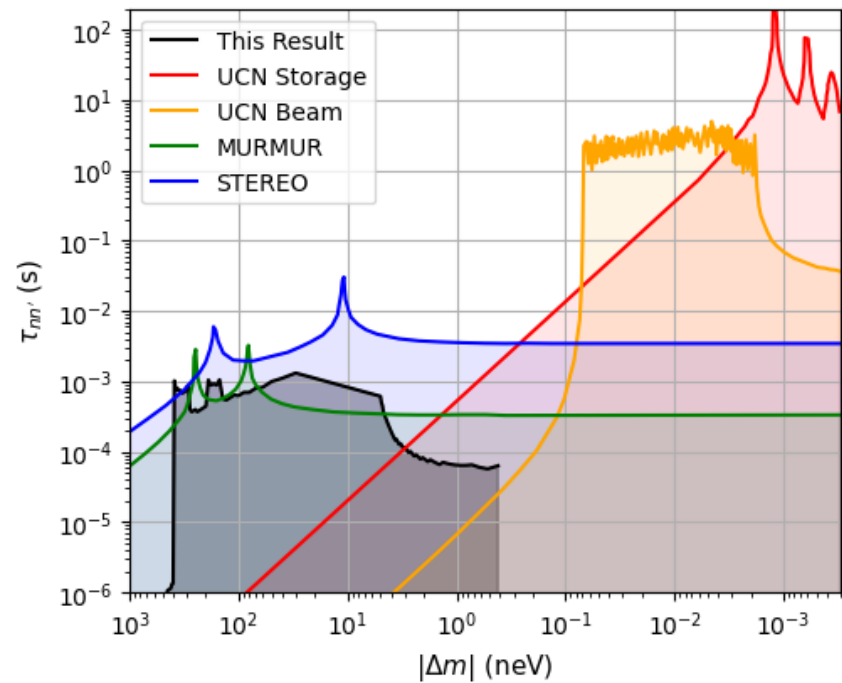
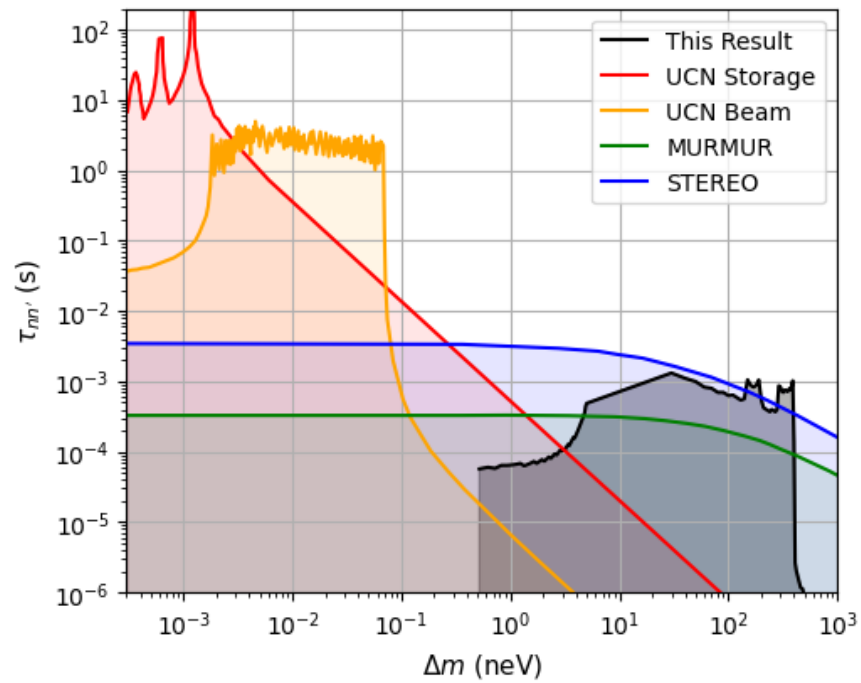
F0: 2.4936 +/- 0.004397
Eta: 0.666947 +/- 0.000604
Chi2: 1.654

To PRD paper discussion at 2024-02-01 zoom meeting. YK

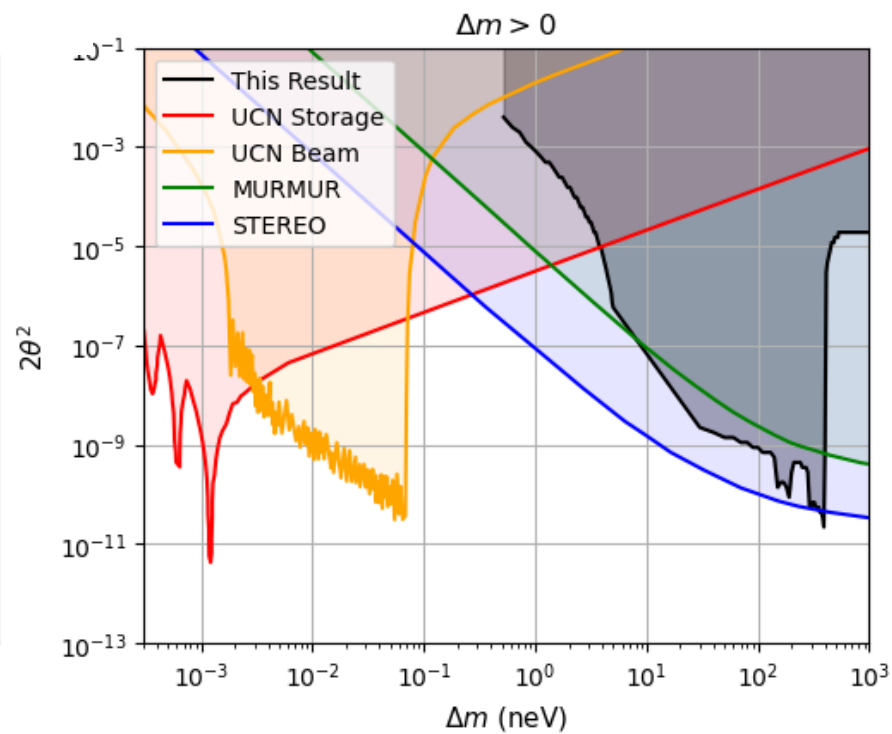
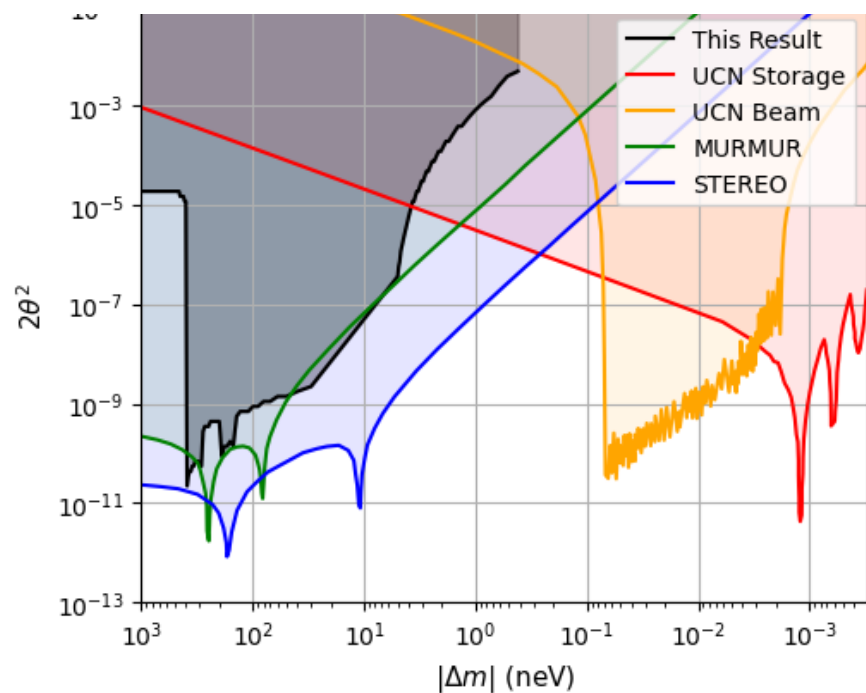
Total Run Time (s)

B Field (T)	Live Time (s)	Foreground Counts	Total Charge (C)	Counts / C	
+4.7	33147	1987 ± 46	45.6	43.5 ± 1.0	22.93 μ C / frame
+2.35	32726	2027 ± 45	45.6	44.4 ± 1.0	23.22 μ C / frame
0	81179	4324 ± 66	96.3	44.9 ± 0.7	19.77 μ C / frame
-2.35	32801	2010 ± 45	45.6	44.1 ± 1.0	23.17 μ C / frame
-4.7	39014	1999 ± 44.7	45.6	43.9 ± 1.0	19.48 μ C / frame

Quoted in paper above Table 1: **23.32 +/- 0.07** (>23 μ C) per frame

$\Delta m < 0$  $\Delta m > 0$ 

Comparison of tau and $2\theta^2$ combination plots in the current format found in paper.



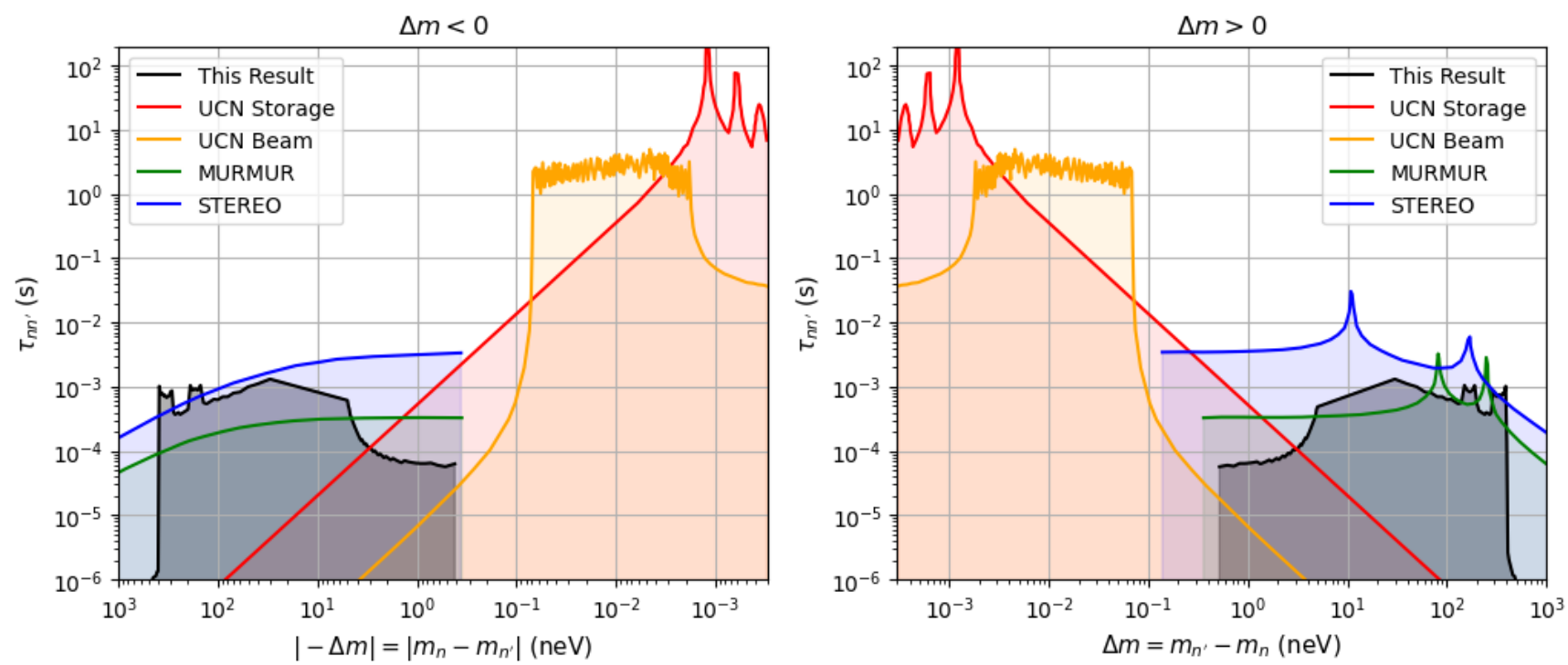


Fig 13 – Limited STEREO and MURMUR to what was presented in Almazan (“STEREO paper”)

STEREO and MURMUR uses $dE = m_n - m_{n'}$, we use $dE = m_n - m_{n'} \Rightarrow$ STEREO negative corresponds to SNS positive

