UConn O-TPC @ HIγS (2012)

Warsaw eTPC @ HIyS (2022)



Looking forward to ELI-NP, Bucharest/ (M. Gai Fulbright US Scholar, 2025)

The Warsaw eTPC



Readout – Warsaw eTPC



Readout

Planar, 3-coordinate, redundant strip arrays, ~1000 channels GET electronics 100 Hz triggering Mikolaj Cwiok, Sarah Stern and Deran Schweitzer assembling the PC Readout Board, Warsaw, June, 2019









Figure 3. Example of a ¹⁶O photo-disintegration candidate event collected at $E_{\gamma}=13.9$ MeV. Positions in strips on the anode plane and time bins along the drift direction are represented in millimetres assuming known strip pitch and electron drift velocity. A 90 mm × 90 mm region of interest is enlarged for each of U, V and W projections (p=250 mbar, 12.5 MHz sampling rate).



Figure 4. Example of a ¹²C photo-disintegration candidate event collected at $E_{\gamma}=13.9$ MeV. Positions in strips on the anode plane and time bins along the drift direction are represented in millimetres assuming known strip pitch and electron drift velocity. A 70 mm × 70 mm region of interest is enlarged for each of U, V and W projections (p=250 mbar, 12.5 MHz sampling rate).

<u>First Analyses:</u> (~ 5% of data) Done By Hand Just like old fashion Bubble Chamber (A lot of clicking)

2nd reprocessing of 8.66 MeV dataset using automatic reconstruction

Video meeting: UW + UConn + SHU + ELI-NP



Mikołaj Ćwiok

25/11/2024



Example of good dE/dx fit : 2-prong $E\gamma = 8.66 \text{ MeV}$







University of Connecticut Laboratory for Nuclear Science at Avery Point (AKA Laboratory for Astrophysics)

Conclusions

TPC data of unprecedented quality:

- 1. Low background, if any
- 2. Measurement in one detector (response, simple Monte Carlo)
- 3. Complete angular distribution (0° 180°) (Measured at 17-20 bin-angles)
- 4. First Physics Result, First Agreement with Unitarity (over $J^{\pi} = 1^{-}$ Resonance)
- 5. New Criteria for Judging Data (Agreement with QM over 1⁻ Resonance)
- 6. Further data measured at HIγS: Warsaw TPC, 2022, New Proposal 2025

In Honor of 2025: The International Quantum Year:

Please do not publish or analyze data that disagree with QM

Collaborators

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