Current Status of MicroBooNE

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(LHEP)

1. LSND Experiment

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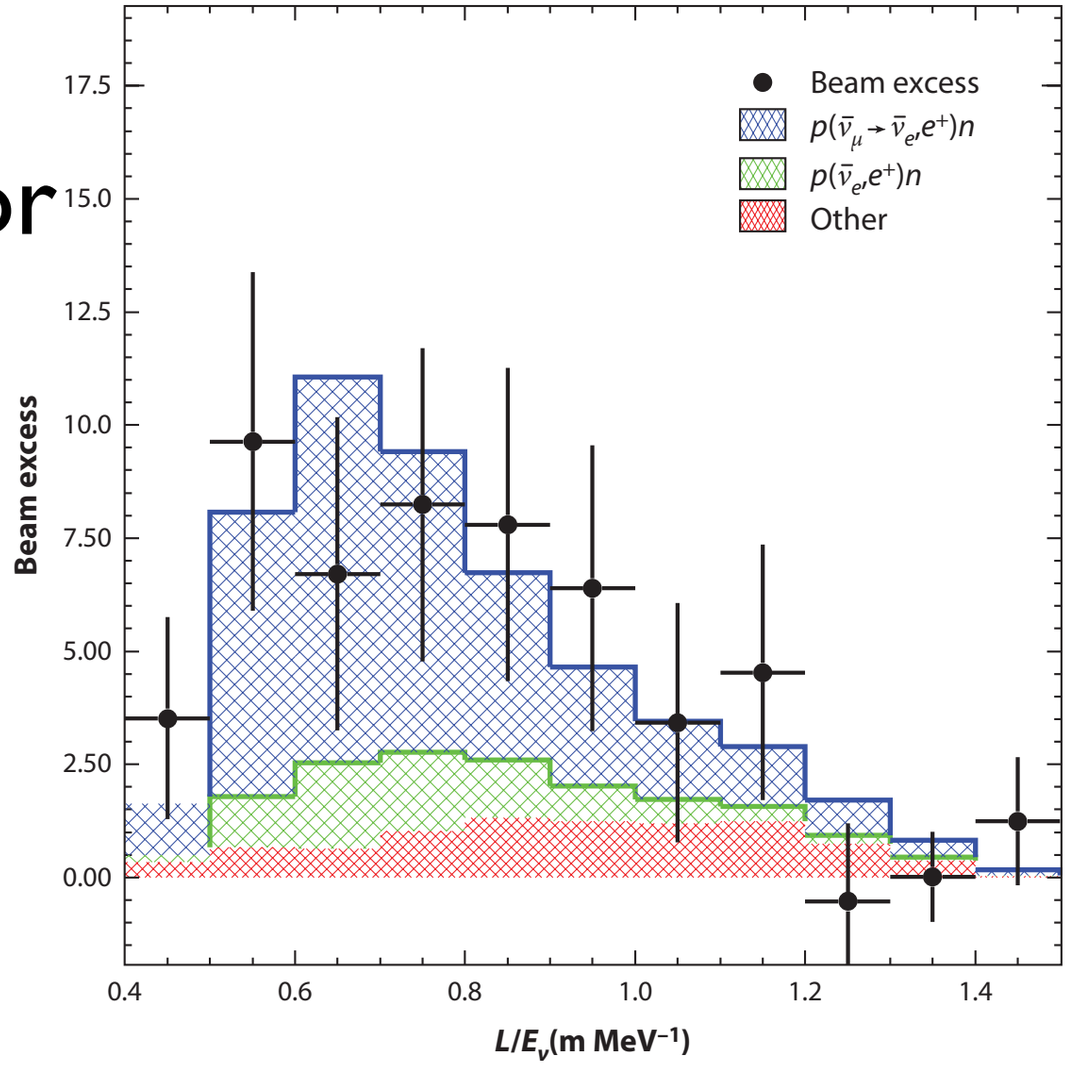
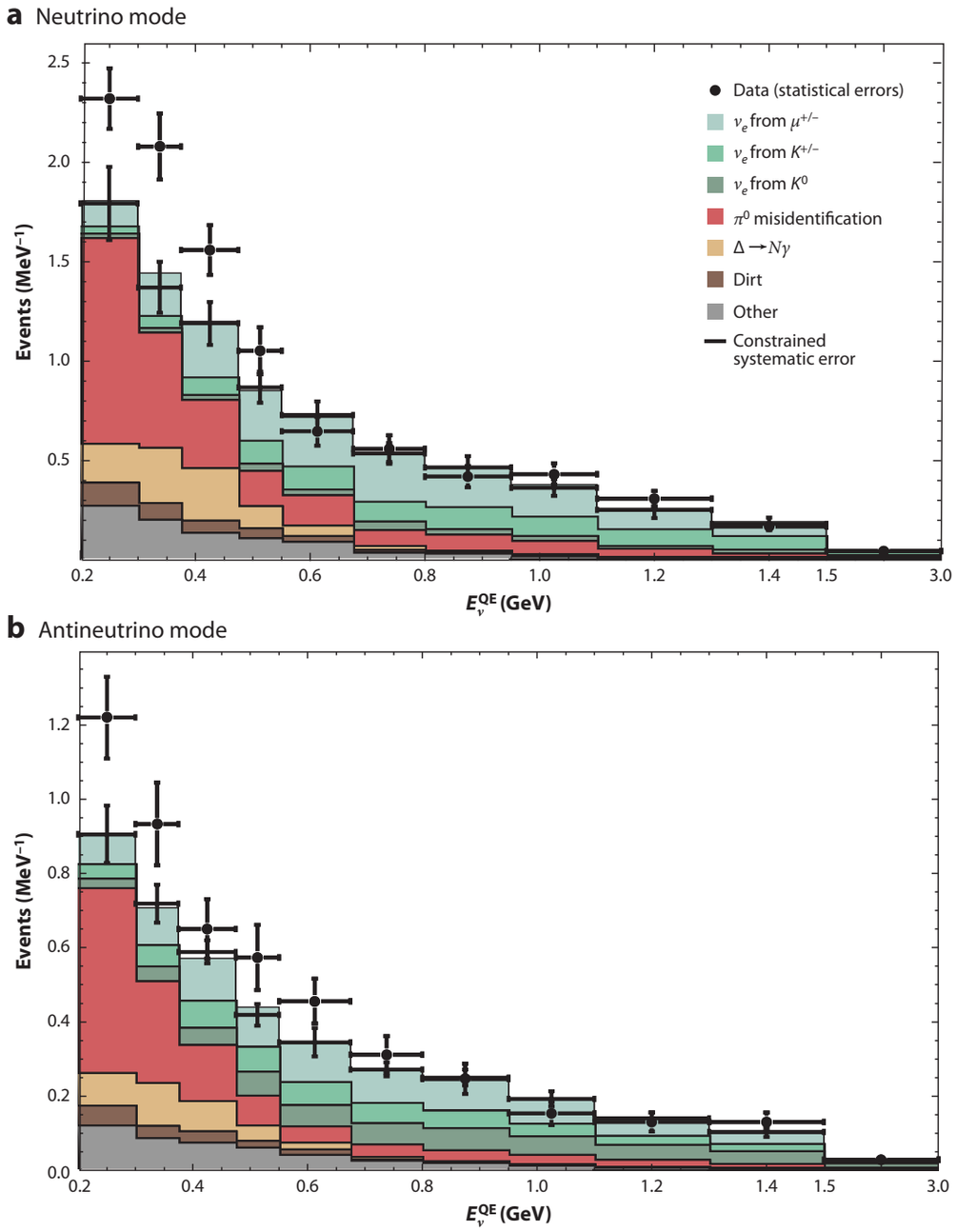
- $\nu_\mu \rightarrow \nu_e$ appearance
- A liquid scintillator detector
- Short-baseline (30m from source)
- Found excess signal at low L/E

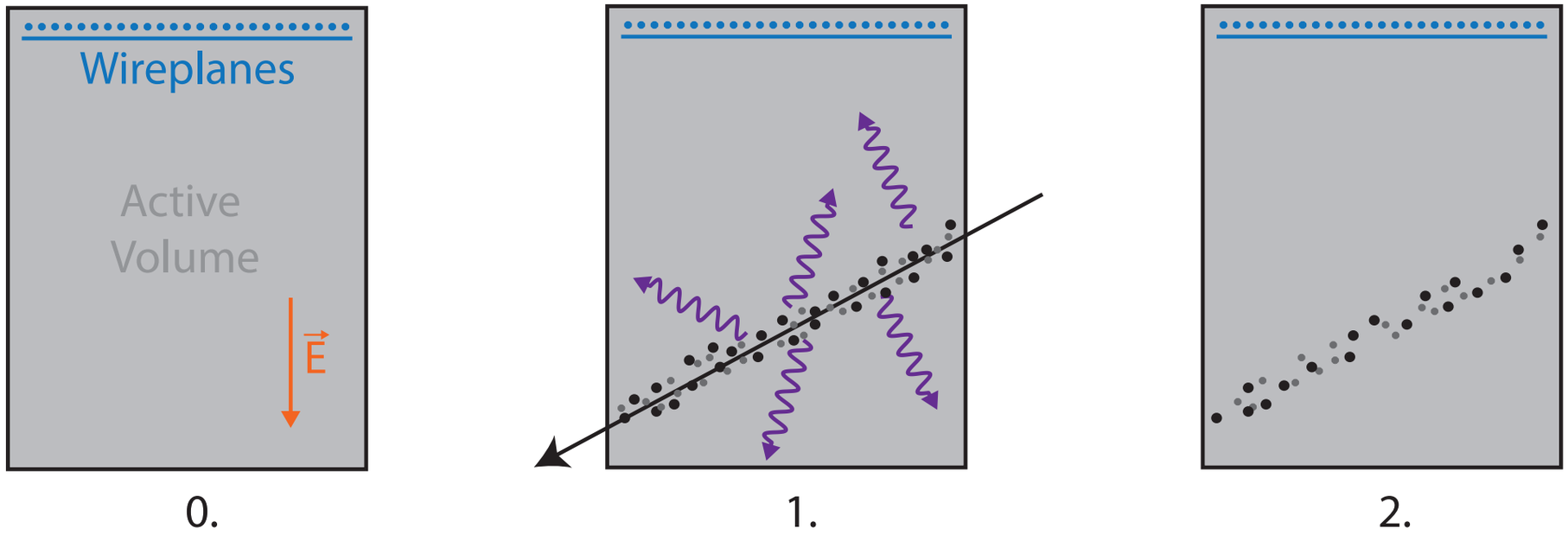


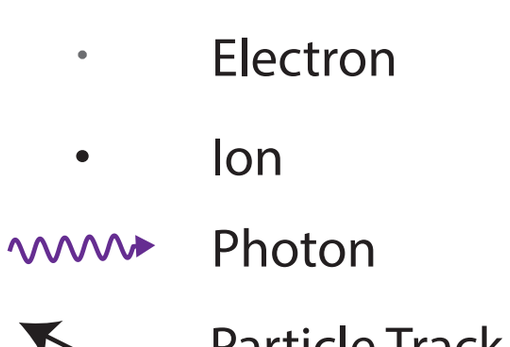
1. MiniBooNE Anomaly

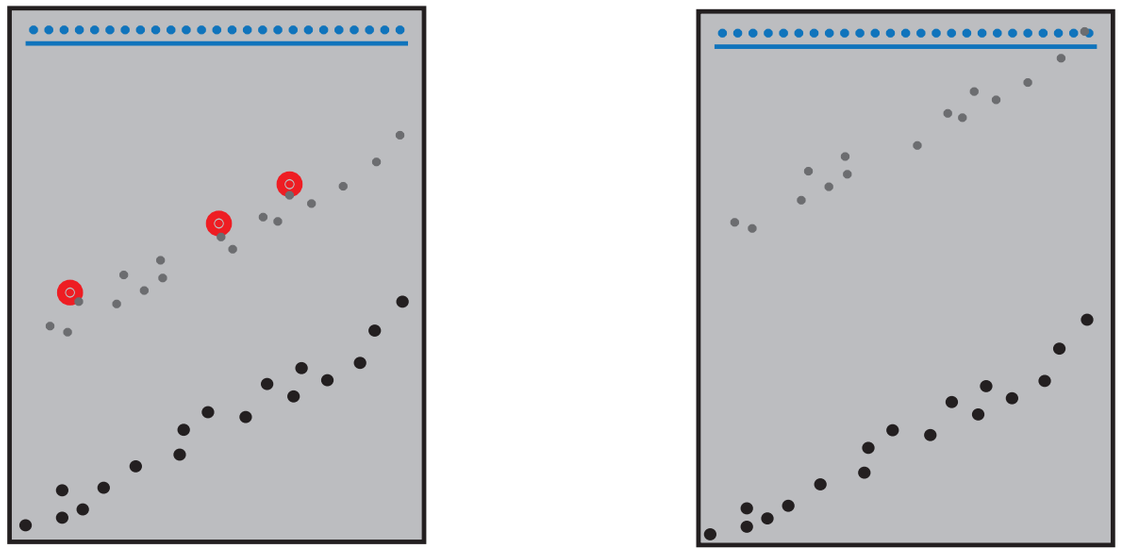
- $\nu_\mu \rightarrow \nu_e$ appearance
- A liquid scintillator detector
- Short-baseline (541m from source)
- Found excess signal



2. TPC Principles







2. Why use liquid argon?

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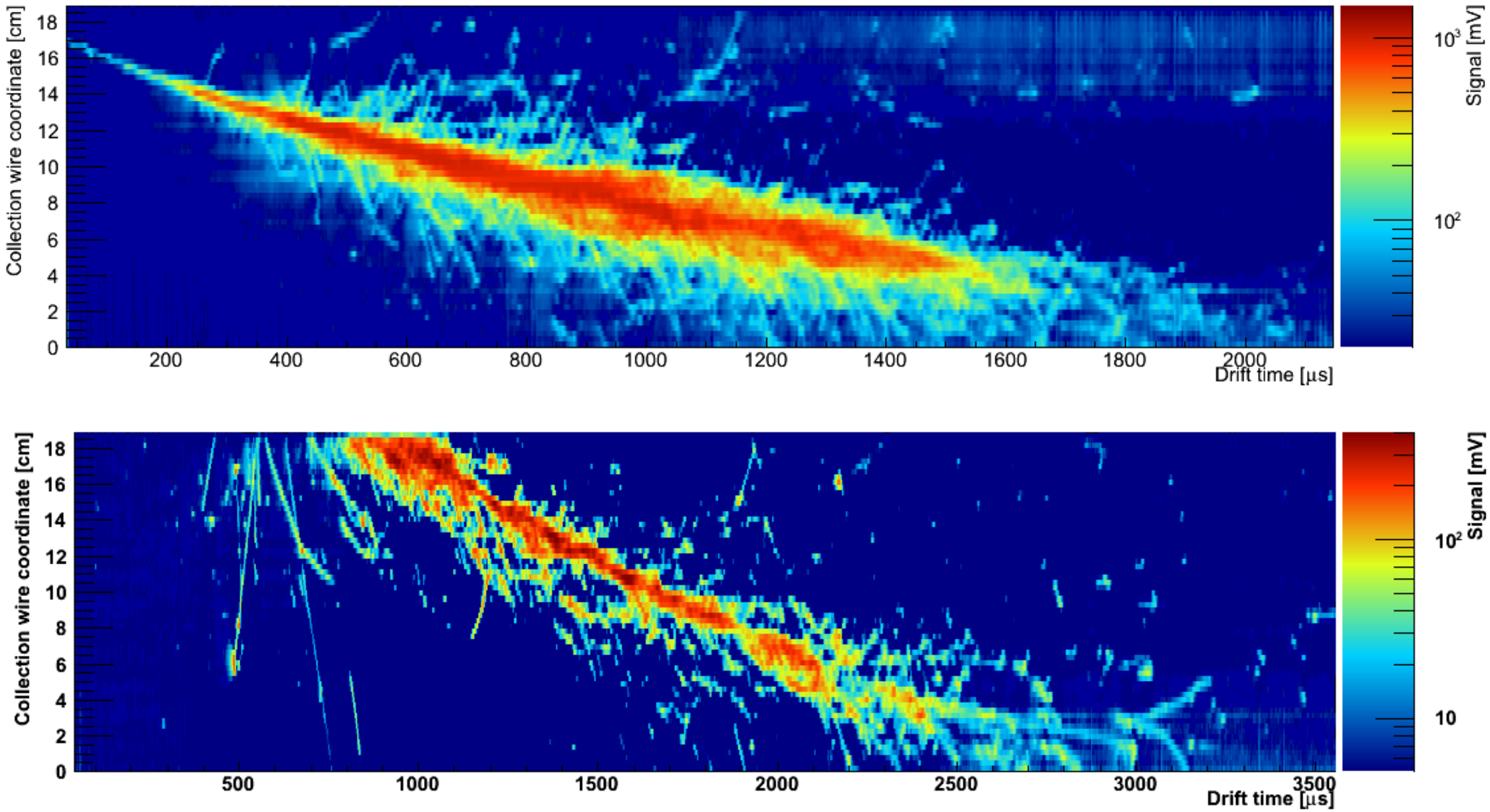
- Dense (1.4 g/cm^3)
- Abundant (1% of the atmosphere)
- Ionization yield of 5500 e/mm for a MIP
- Promt Scintillation (ns)
- Liquid at 87K

2. Liquid Argon TPC Performance



3. The MicroBooNE Detector

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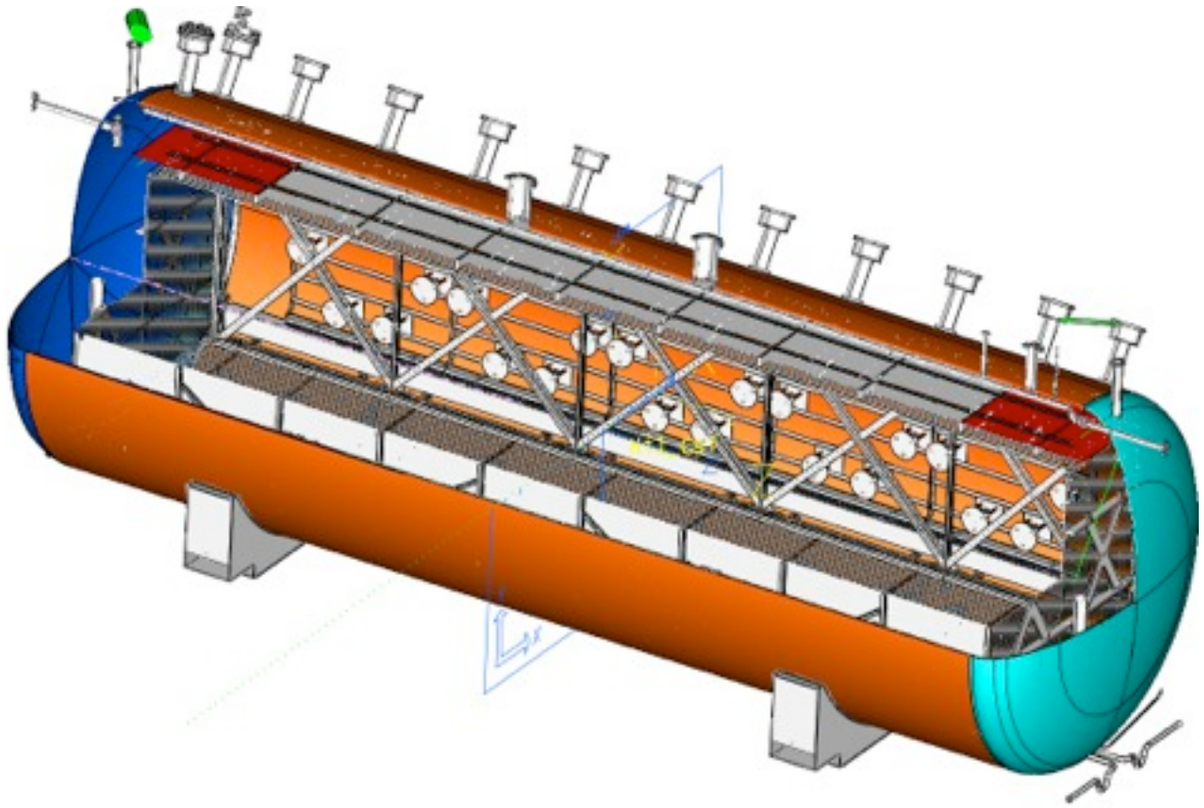
- 2.5m x 2.3m x 10.2m liquid Argon TPC
- 80t fiducial volume
- 2.5m drift length
- 3 wire planes 0° ±60°
- 3mm wire pitch
- 36 8” Photomultipliers
- Located in the BNB at Fermilab

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SAFETY

3. The MicroBooNE Detector

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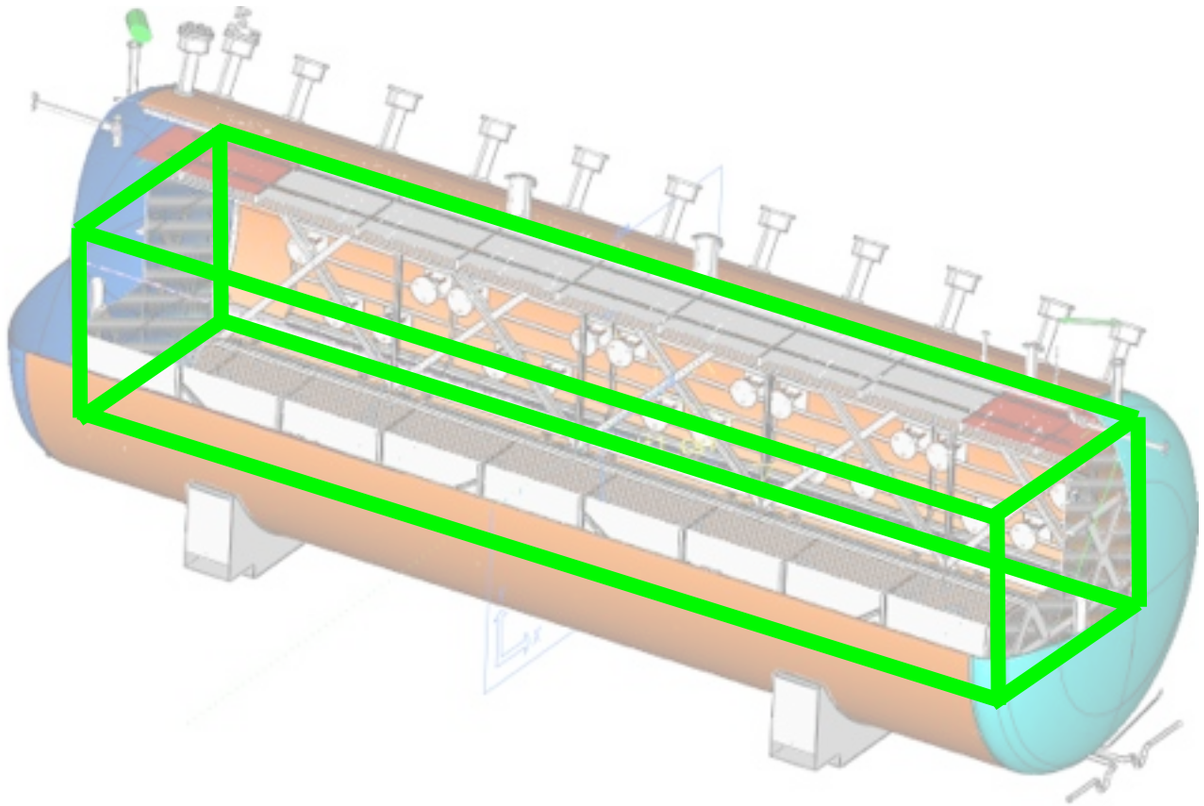

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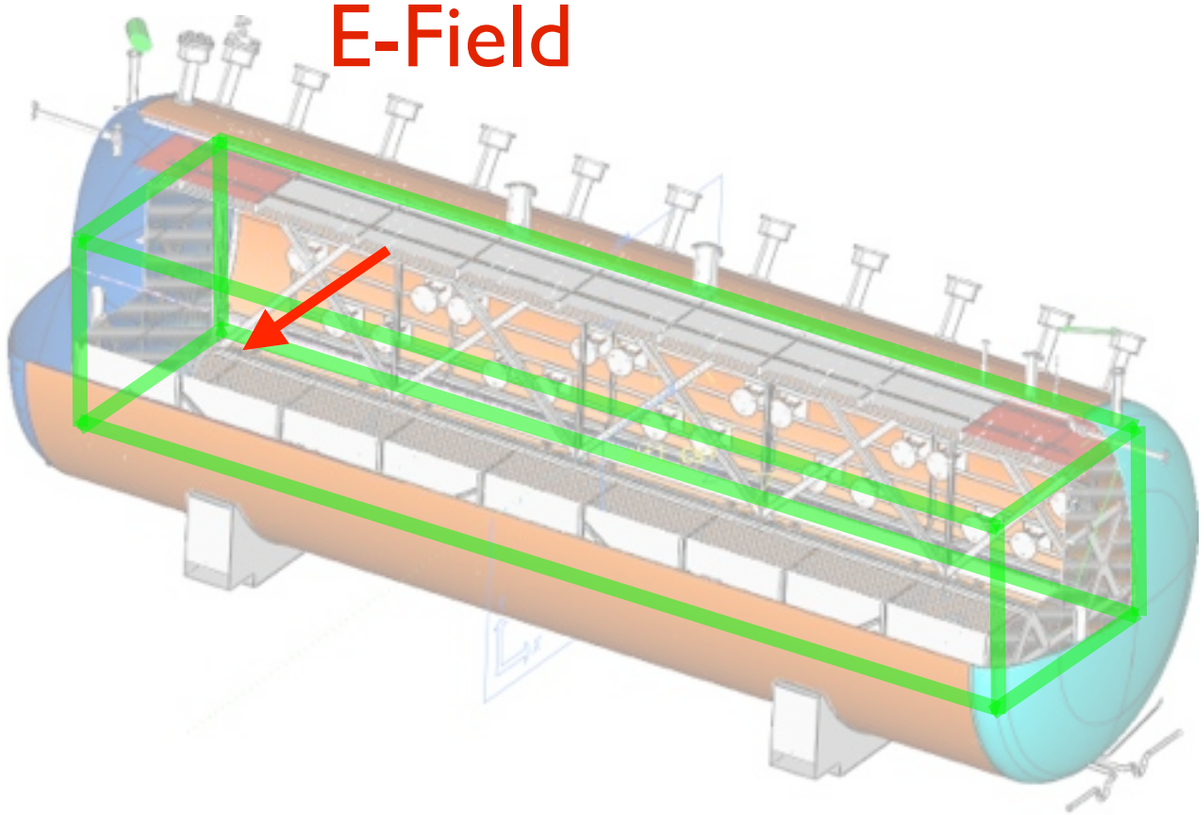

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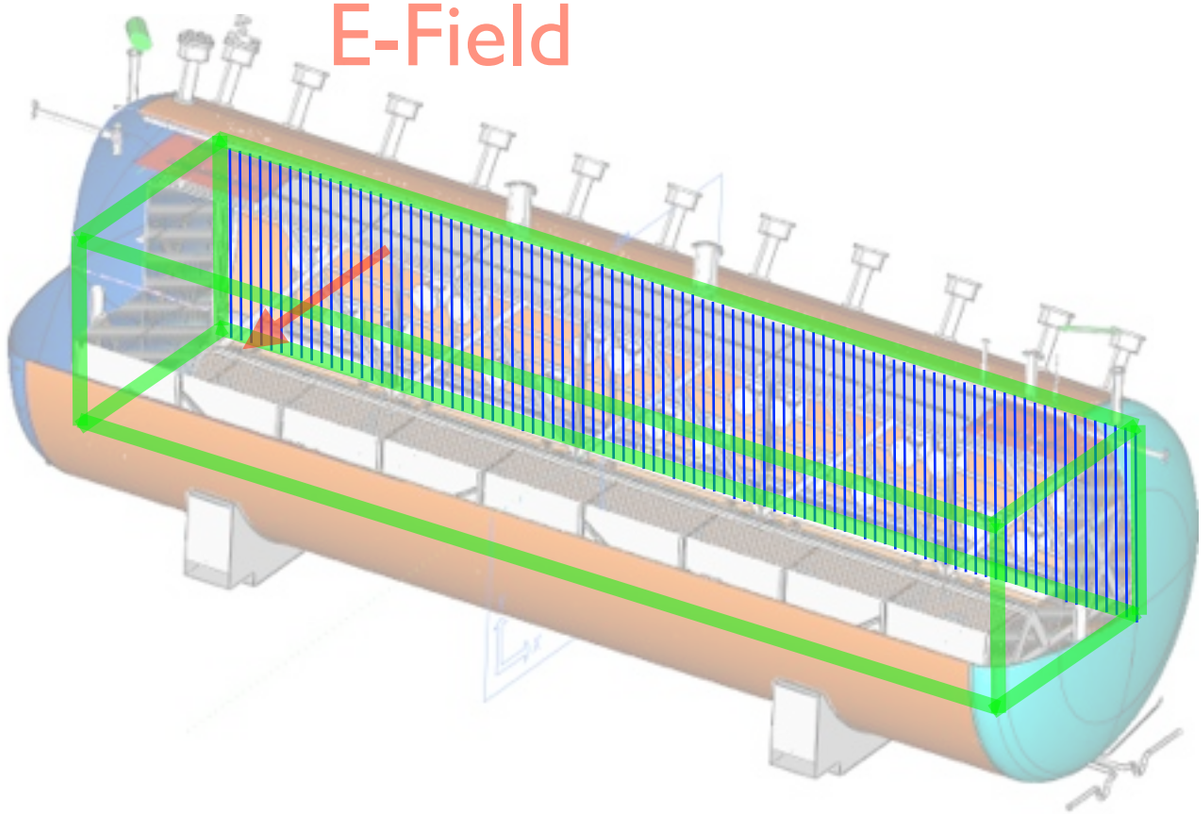

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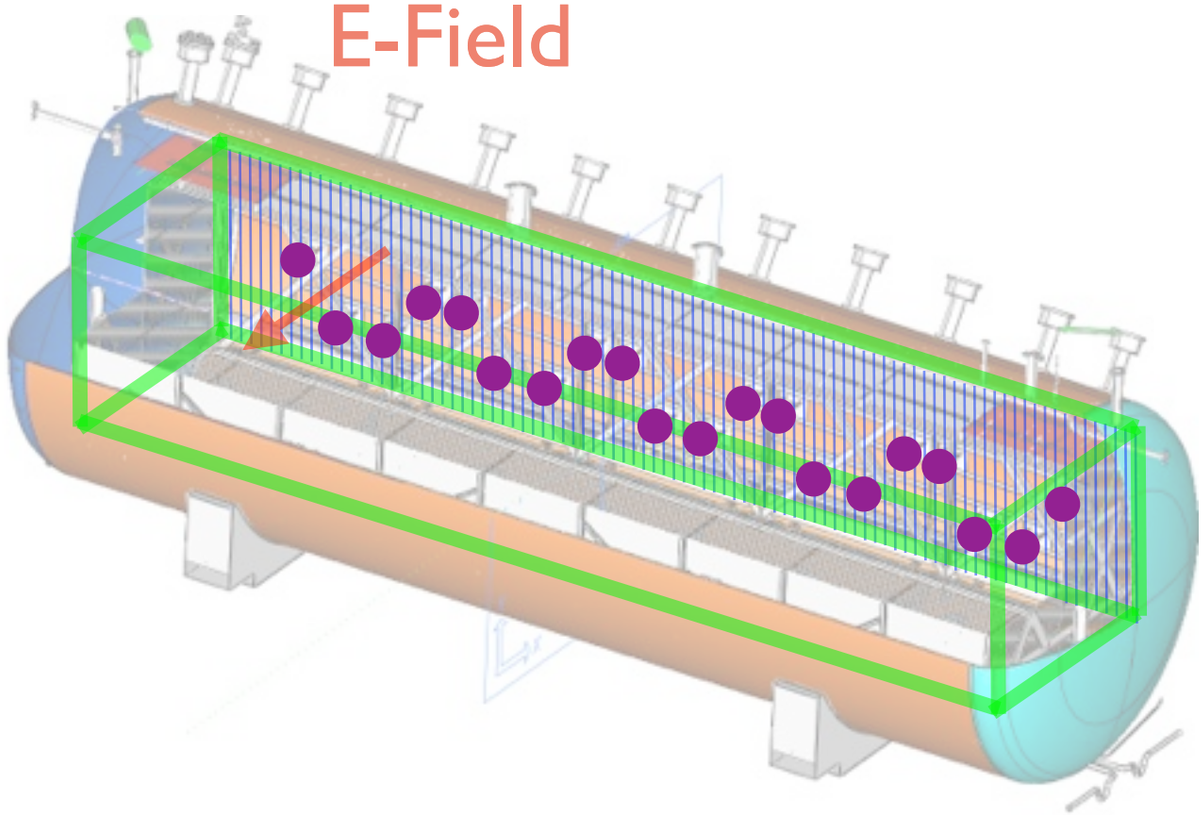

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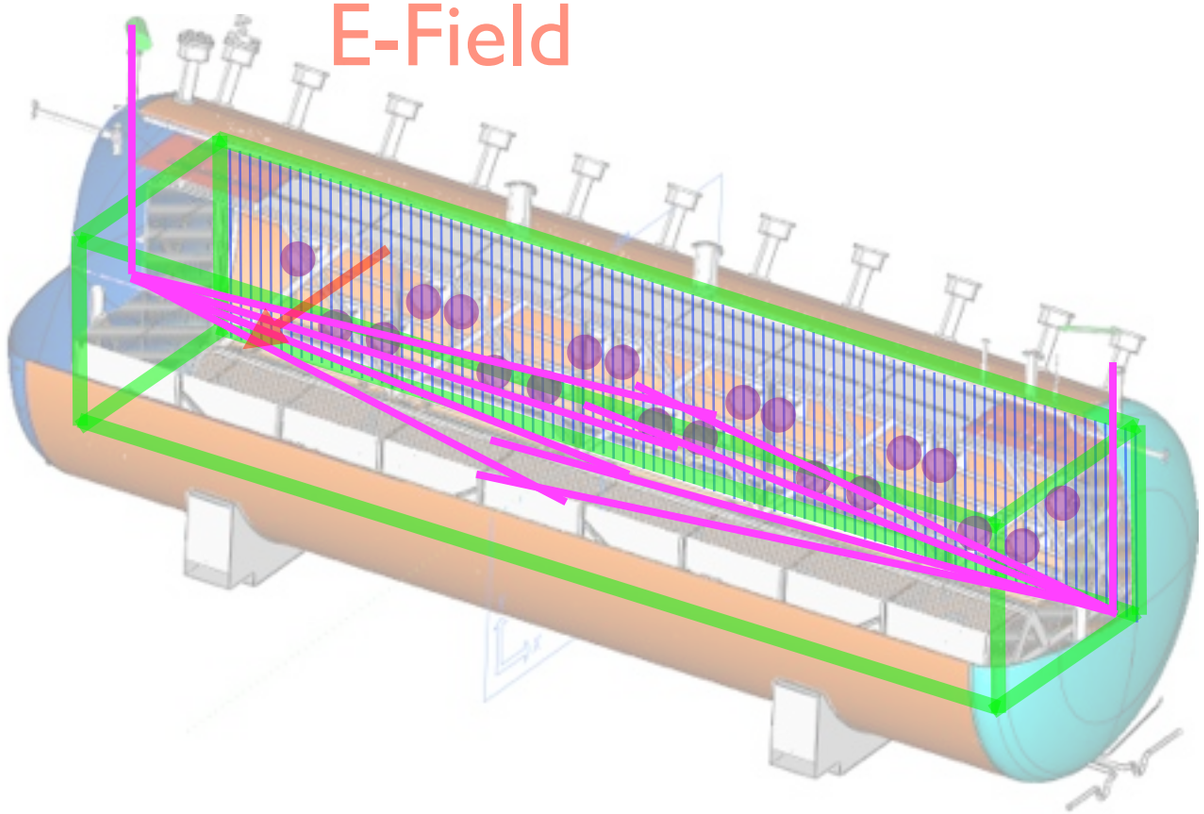

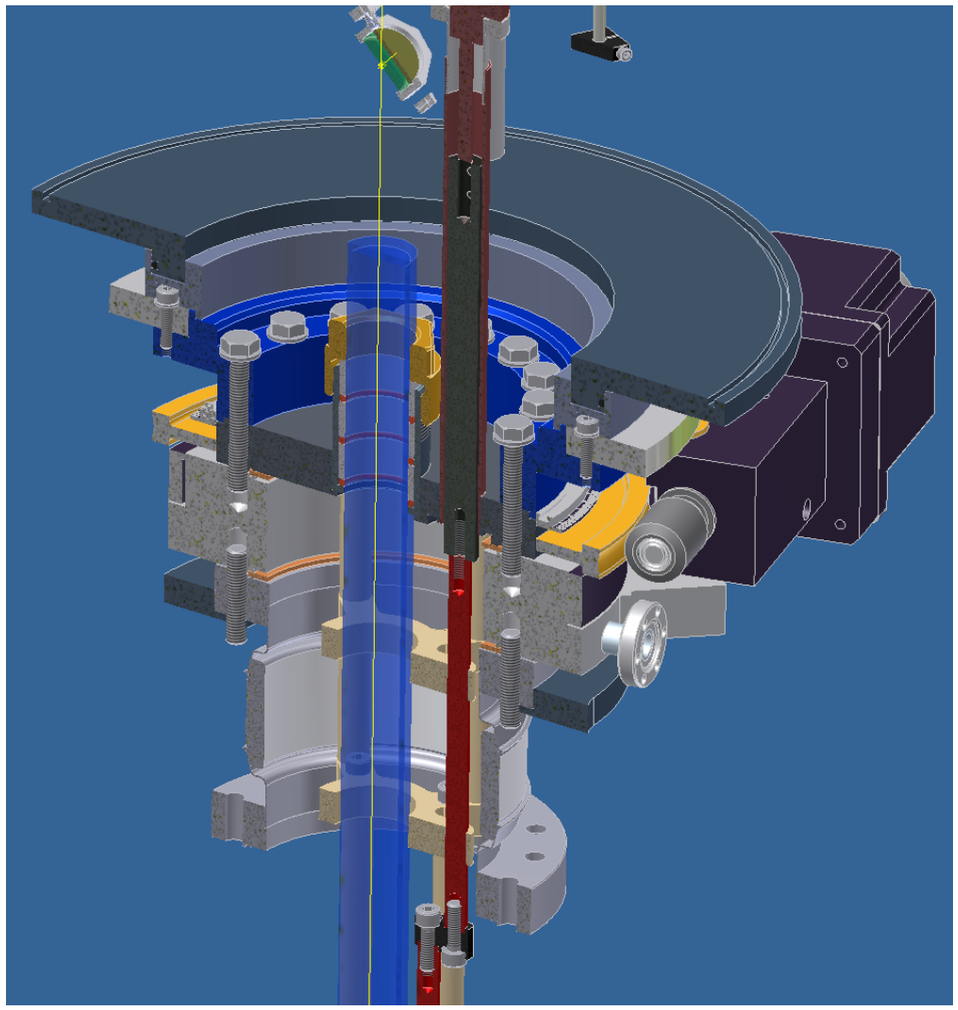

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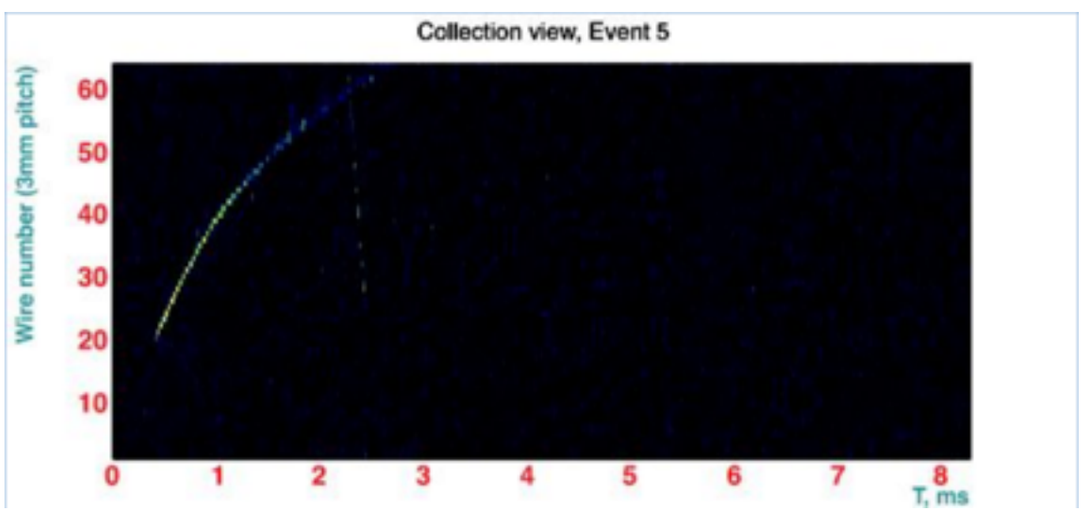

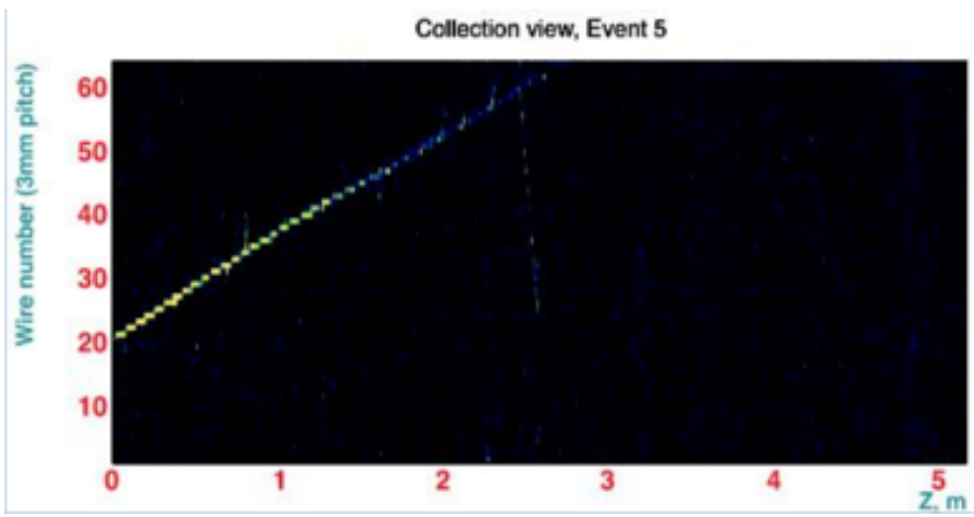

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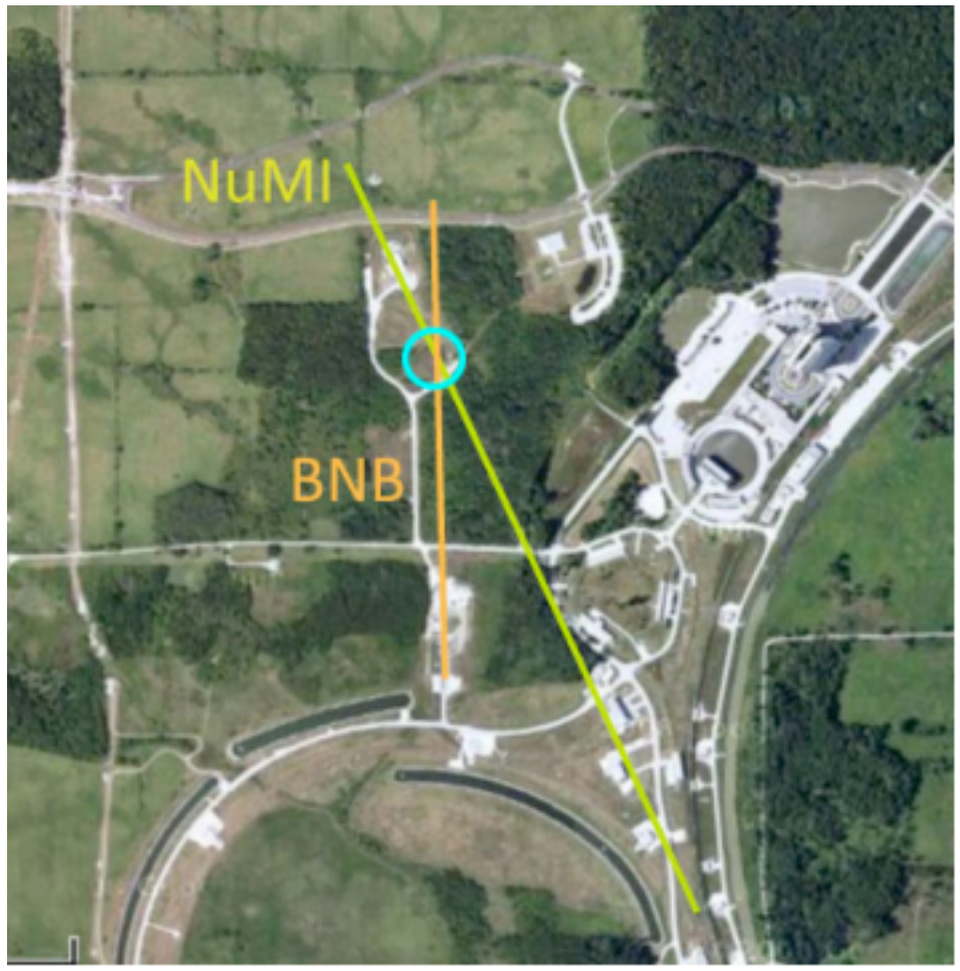
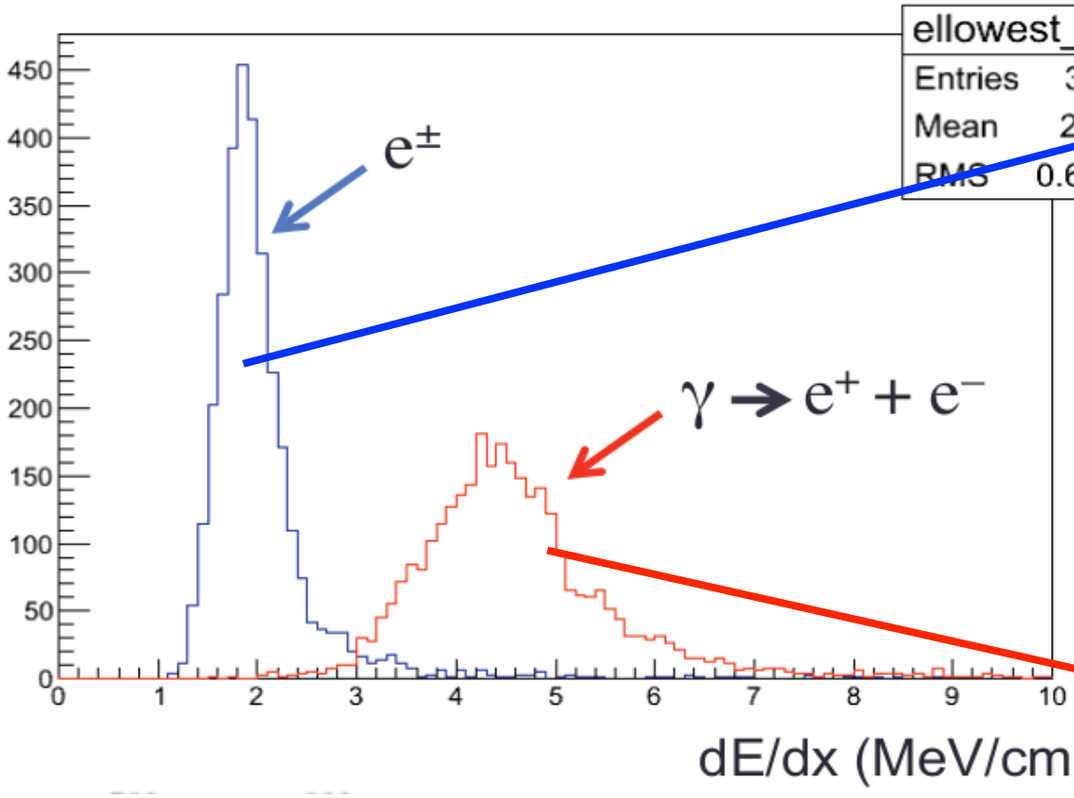
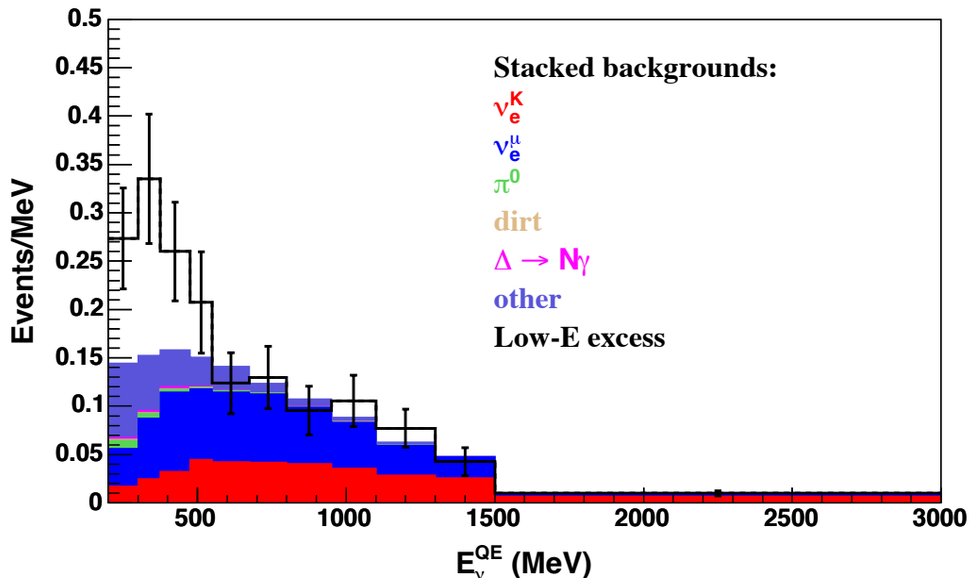


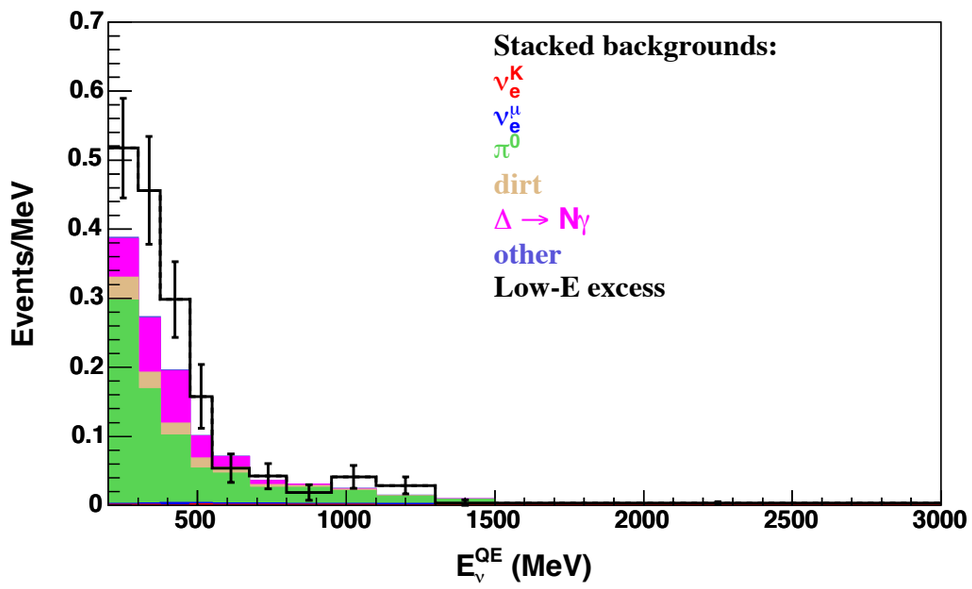
4. Physics: e/γ separation



5σ



4σ



3. Conclusion

- MicroBooNE will determine the origin of the MiniBooNE low energy signal excess
- MicroBooNE will perform cross-section measurements
- MicroBooNE will provide valuable R&D towards kilo-ton scale LAr TPCs
- MicroBooNE will start data taking end of the year
- MicroBooNE together with a far and near detector could bring light into the short-baseline neutrino anomalies

Thank You

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1. LSND and MiniBooNE Anomaly

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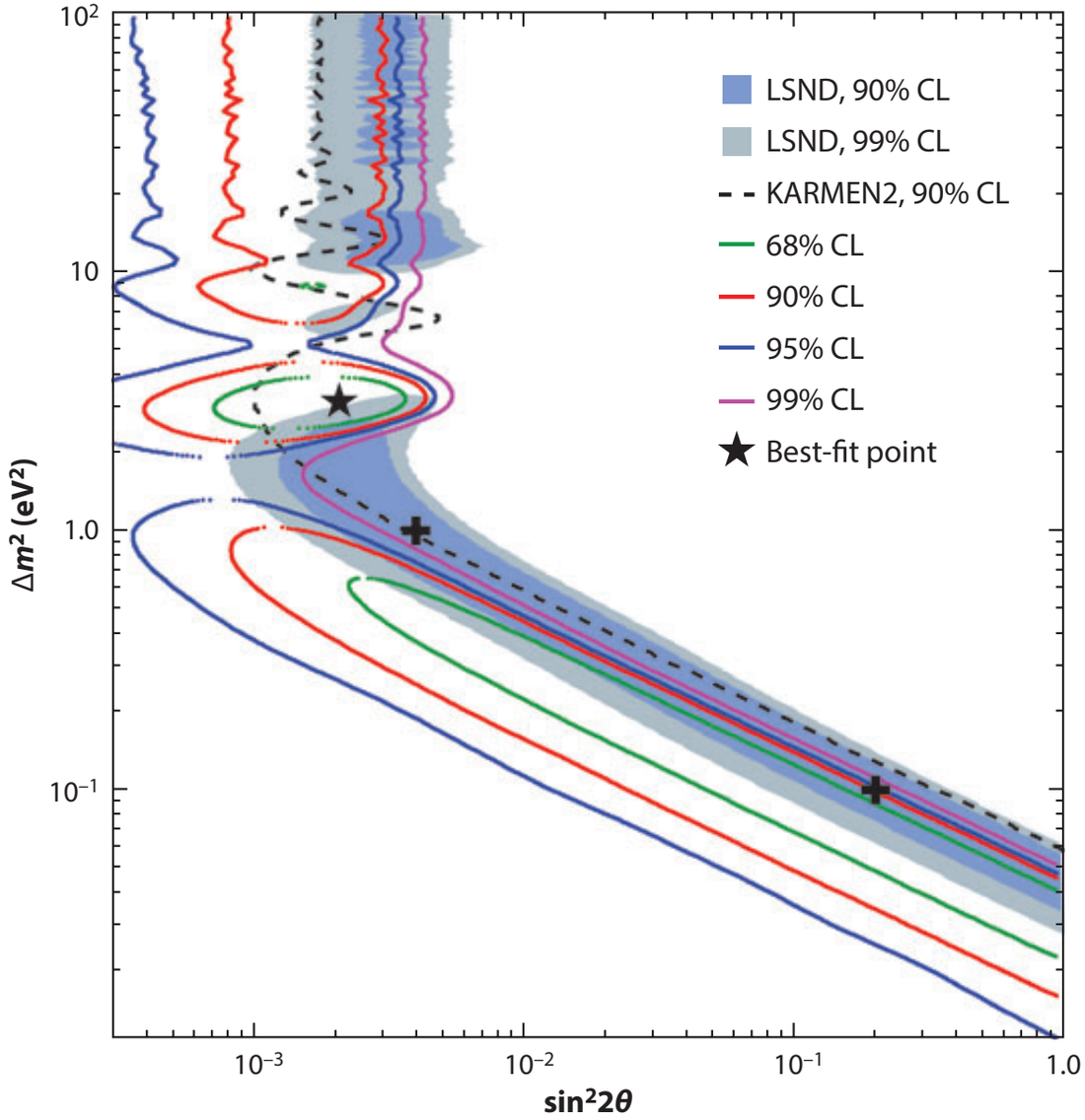
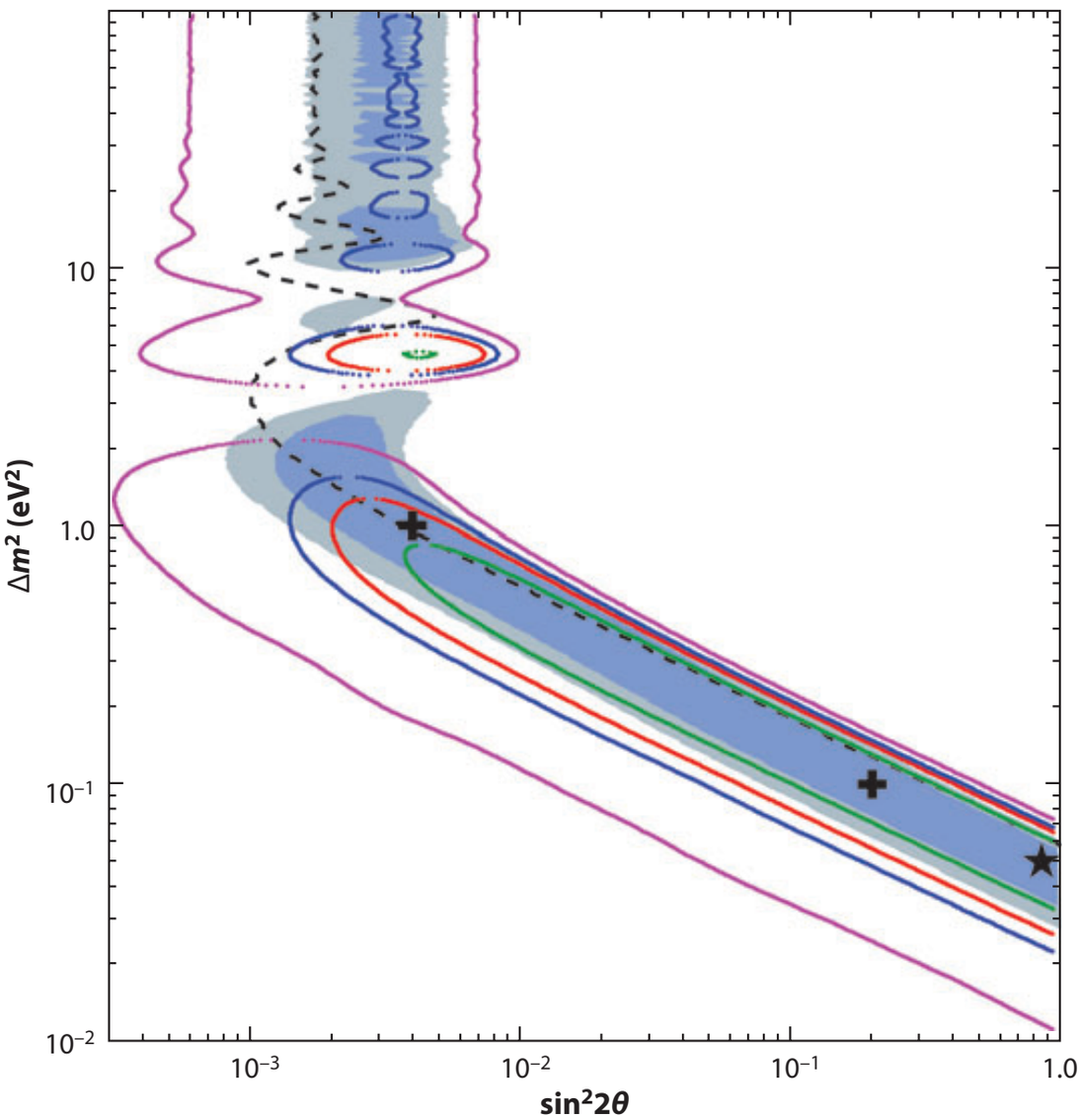
Neutrino



Antineutrino



4. Physics: Oscillation