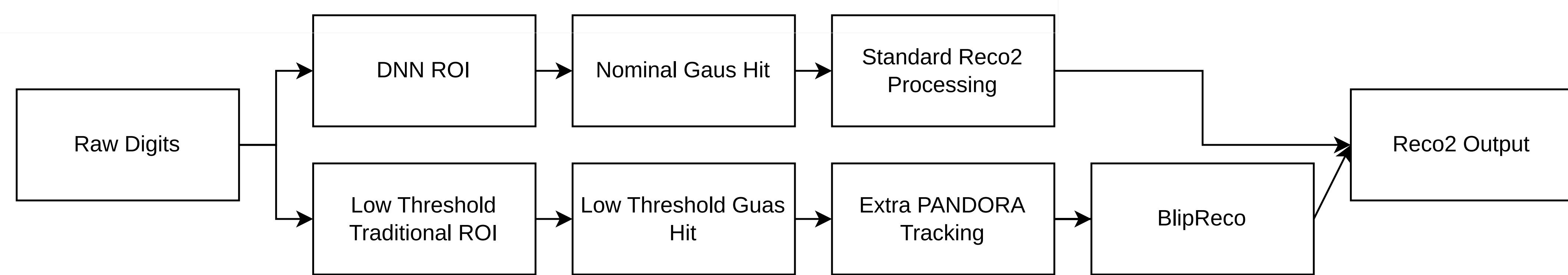


## 1. What's a "blip"

- Energy depositions in liquid argon are converted into ionization (charge), scintillation (light) and heat channels
- **Blips are small (~mm) scale interactions with hits on two to three planes**

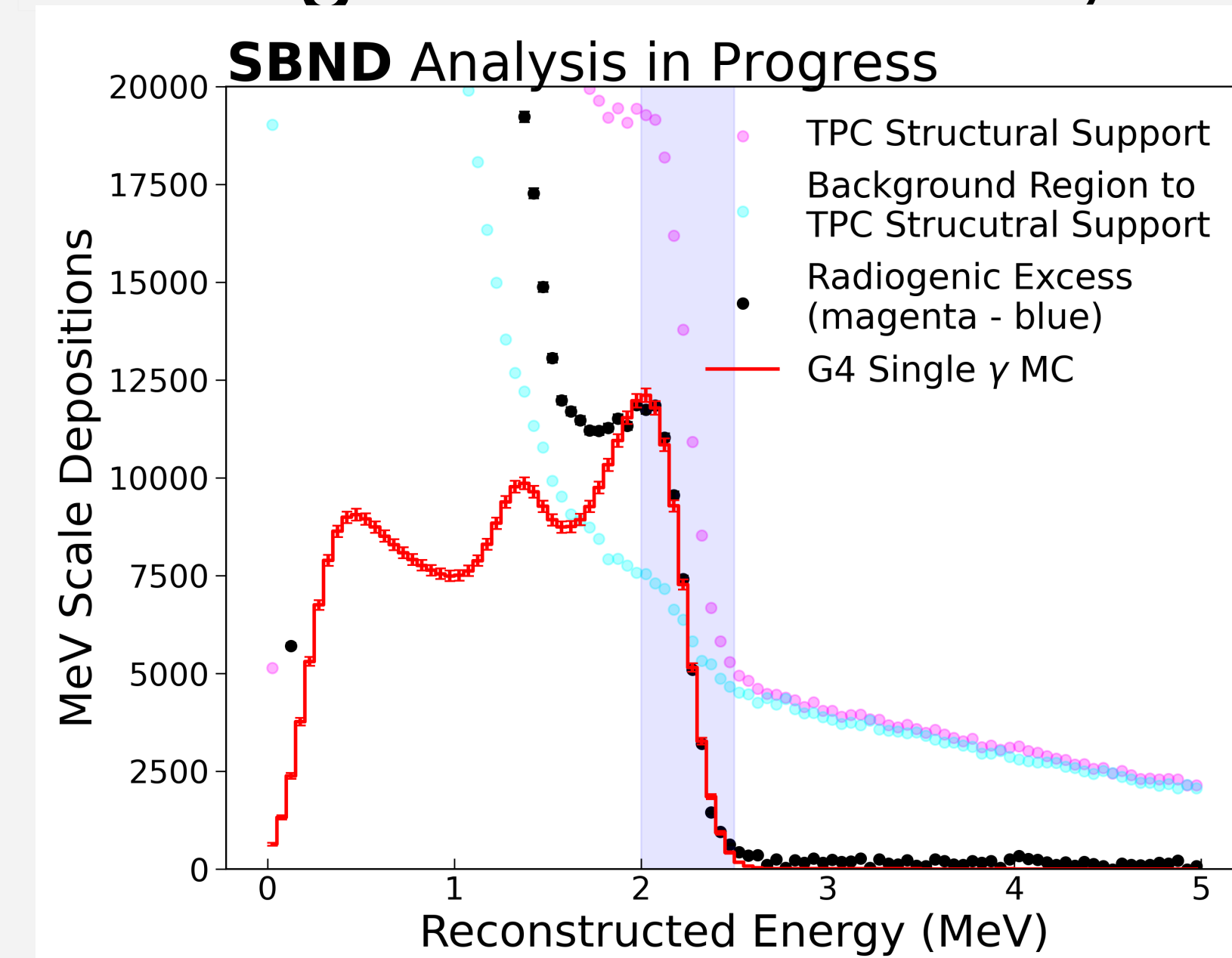
- Parallel processing tracks allow for special lowered reconstruction settings

- Implementation in standard LArSoft tools make sharing reconstruction tools with DUNE easy



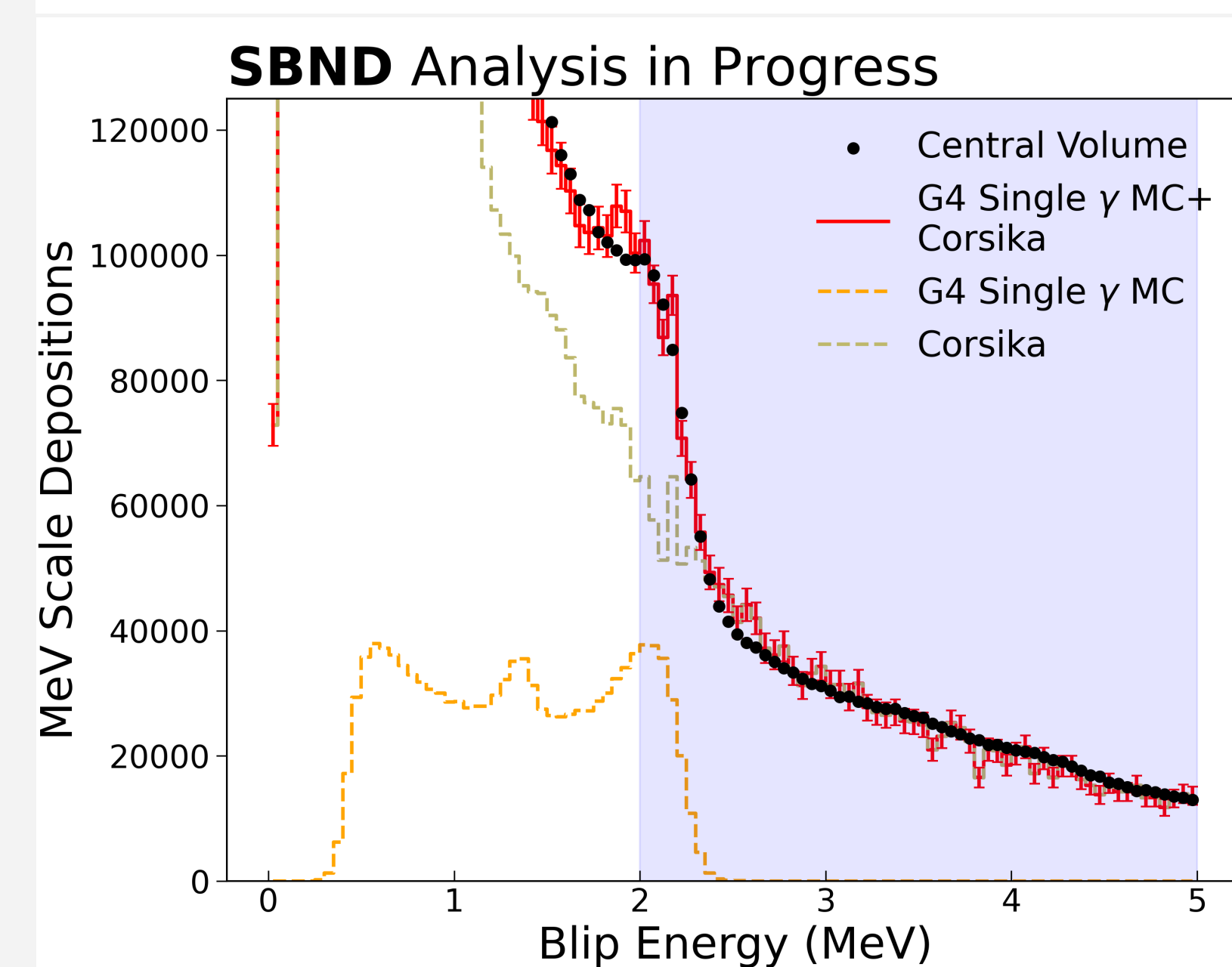
## 3. <sup>208</sup>Tl Compton Edge Fits

- Fits to the structural support hotspot region (top) and central fiducial (bottom) <sup>208</sup>Tl edges are performed
- The central fiducial region has a less prominent edge, and no background estimate, so Corsika cosmic sims are included



### Strut Results

- True Bias: -7.3%
- True Resolution: 7.9%
- Sim Matching Bias: +8.1%
- Sim Matching Smear: 5.6%
- **<10% residual energy bias between MC and data across detector**

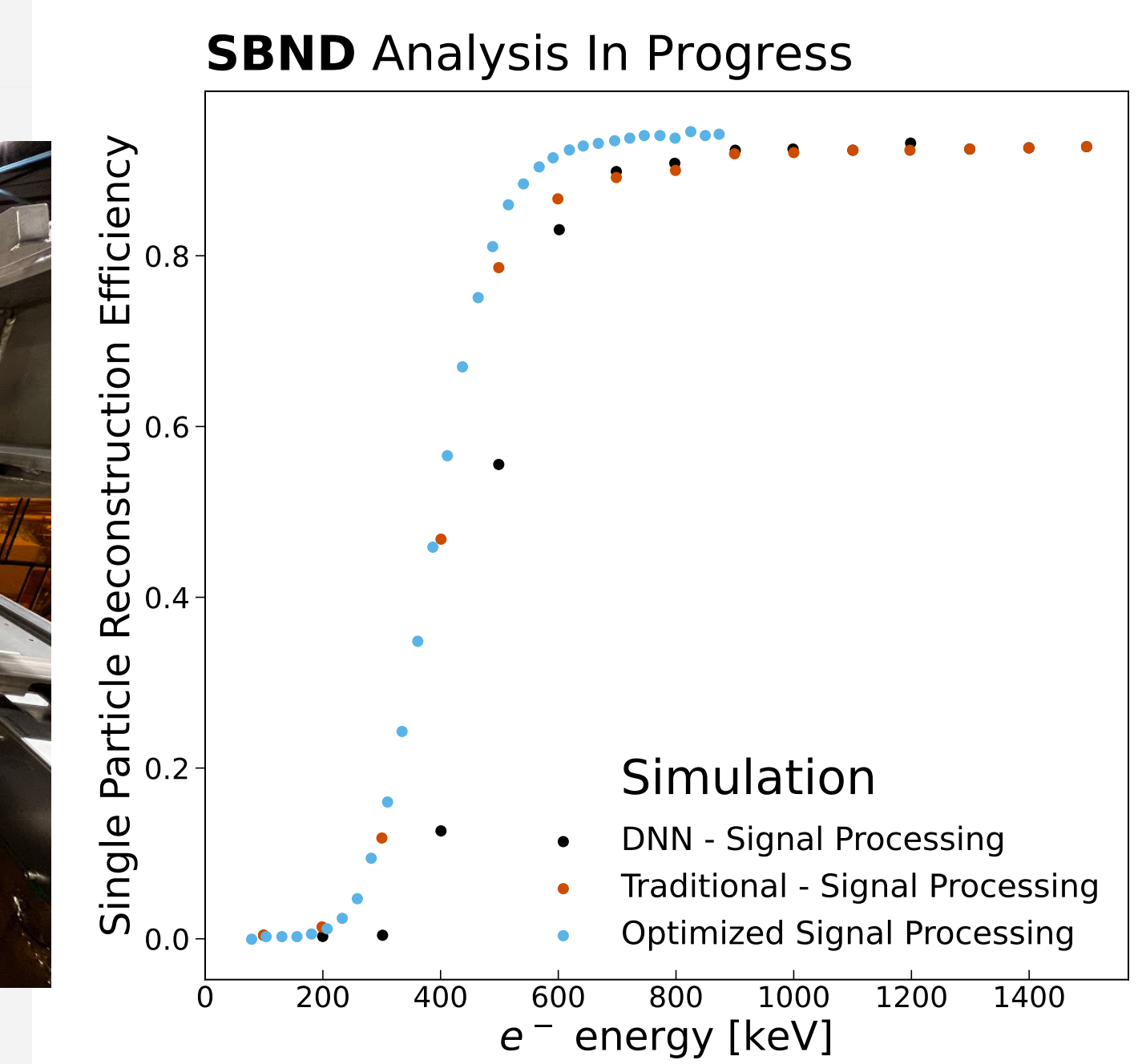
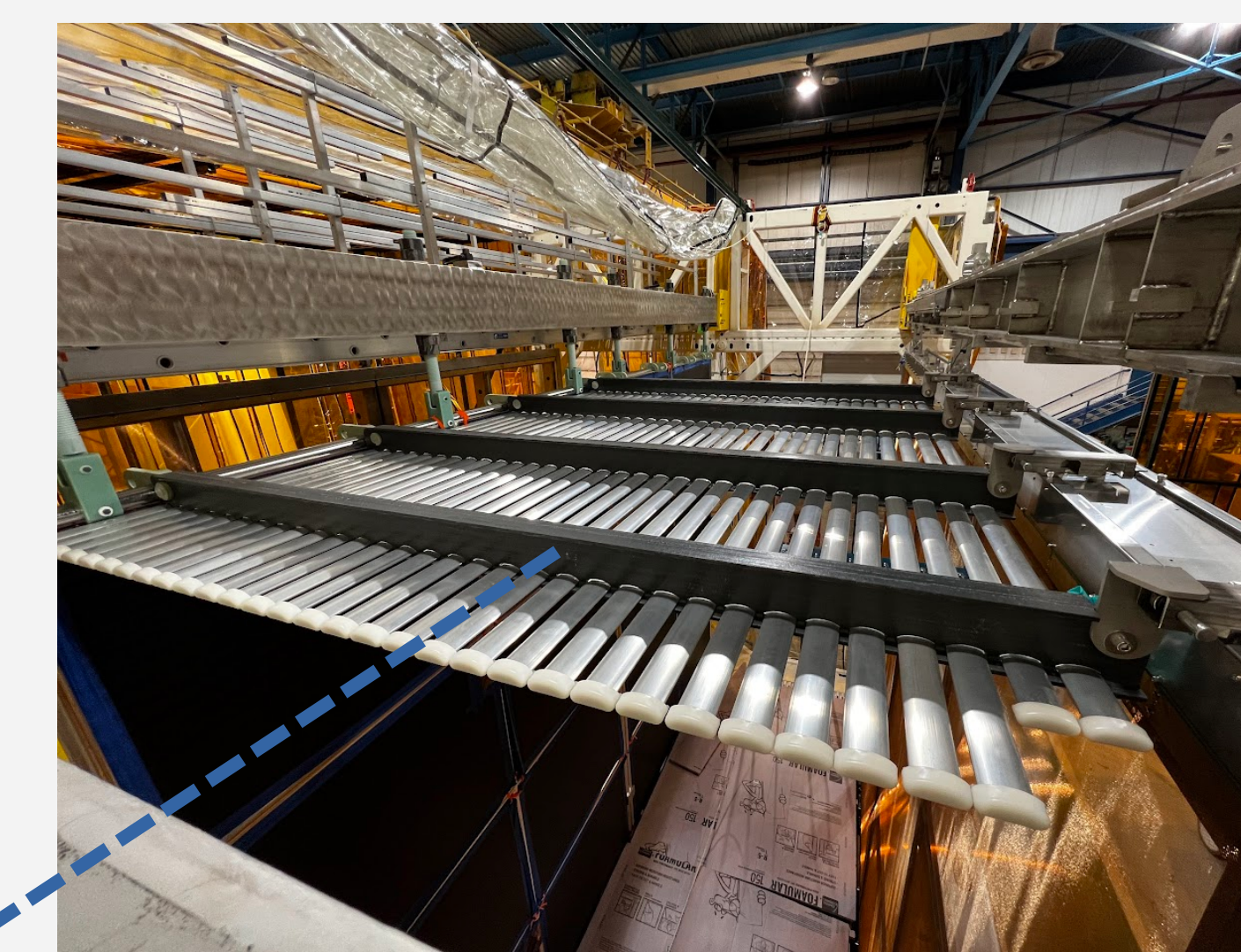


### Central Fiducial Result

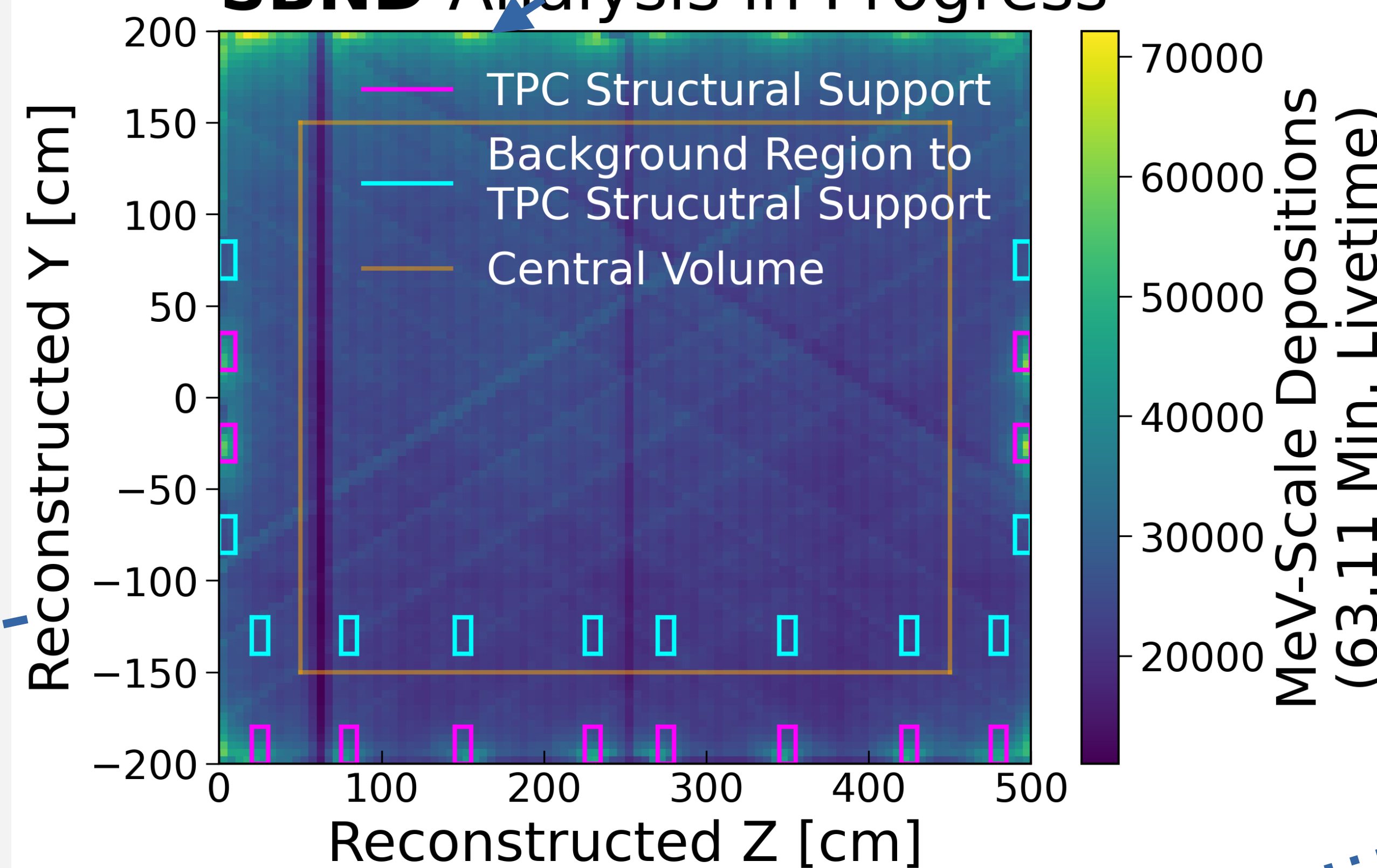
- True Bias: -7.7%
- True Resolution: 5.2%
- Sim Matching Bias: +8.0%
- Sim Matching Smear: 0%
- **Central volume MC resolution matches data well with similar energy bias to struts**

## 2. SBND Blip Reconstruction Efficiency and Calibration Data

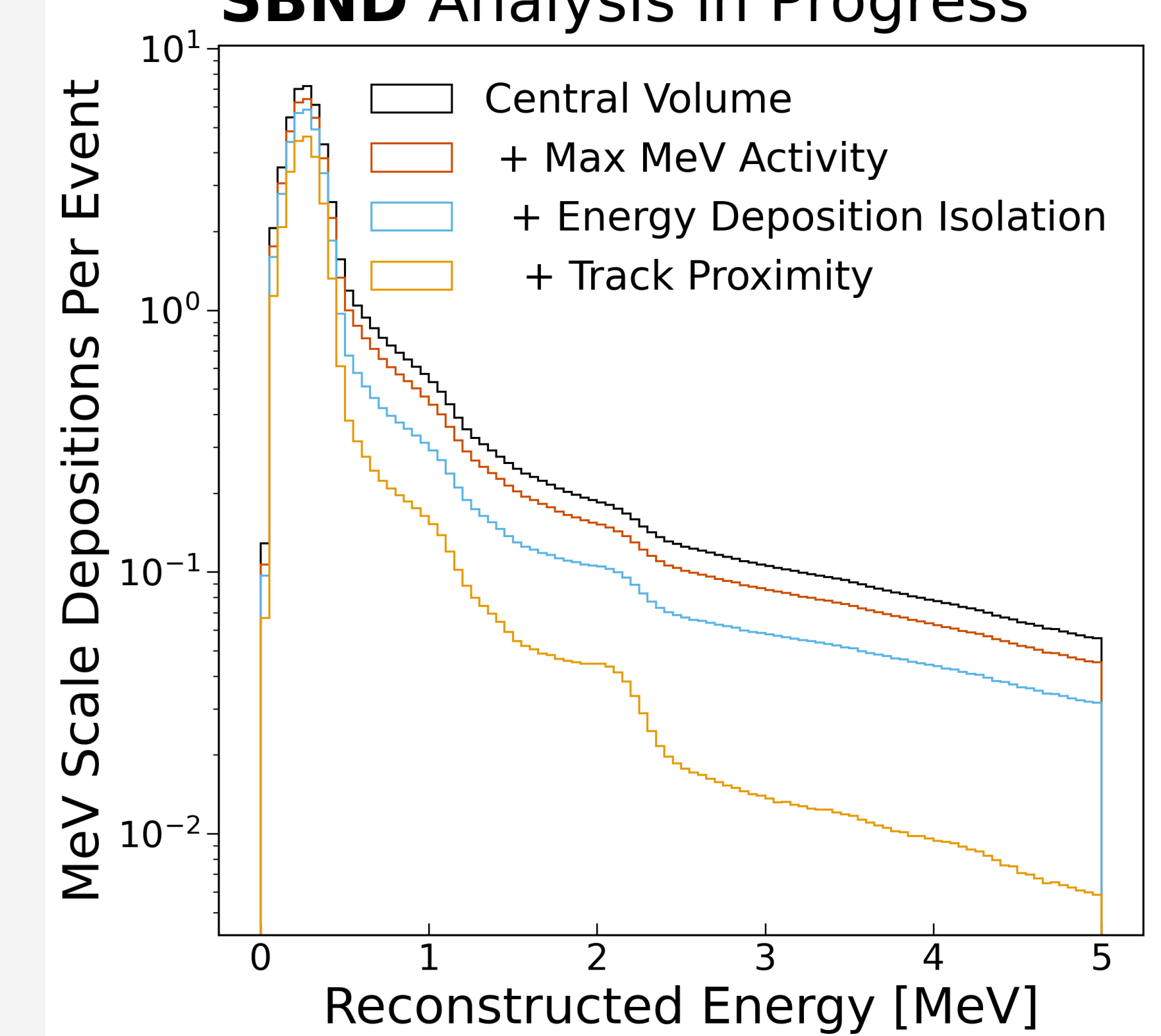
- Blips' small size makes direct measurement of dQ/dx difficult
- A distinct set of simulations and calibration analyses are needed to understand blip calorimetry and validate MC
- Radiogenic signals offer such a calibration
- **Fits to radiogenic spectrum offer an excellent blip calibration, with <sup>208</sup>Tl being particularly prominent**



## SBND Analysis in Progress



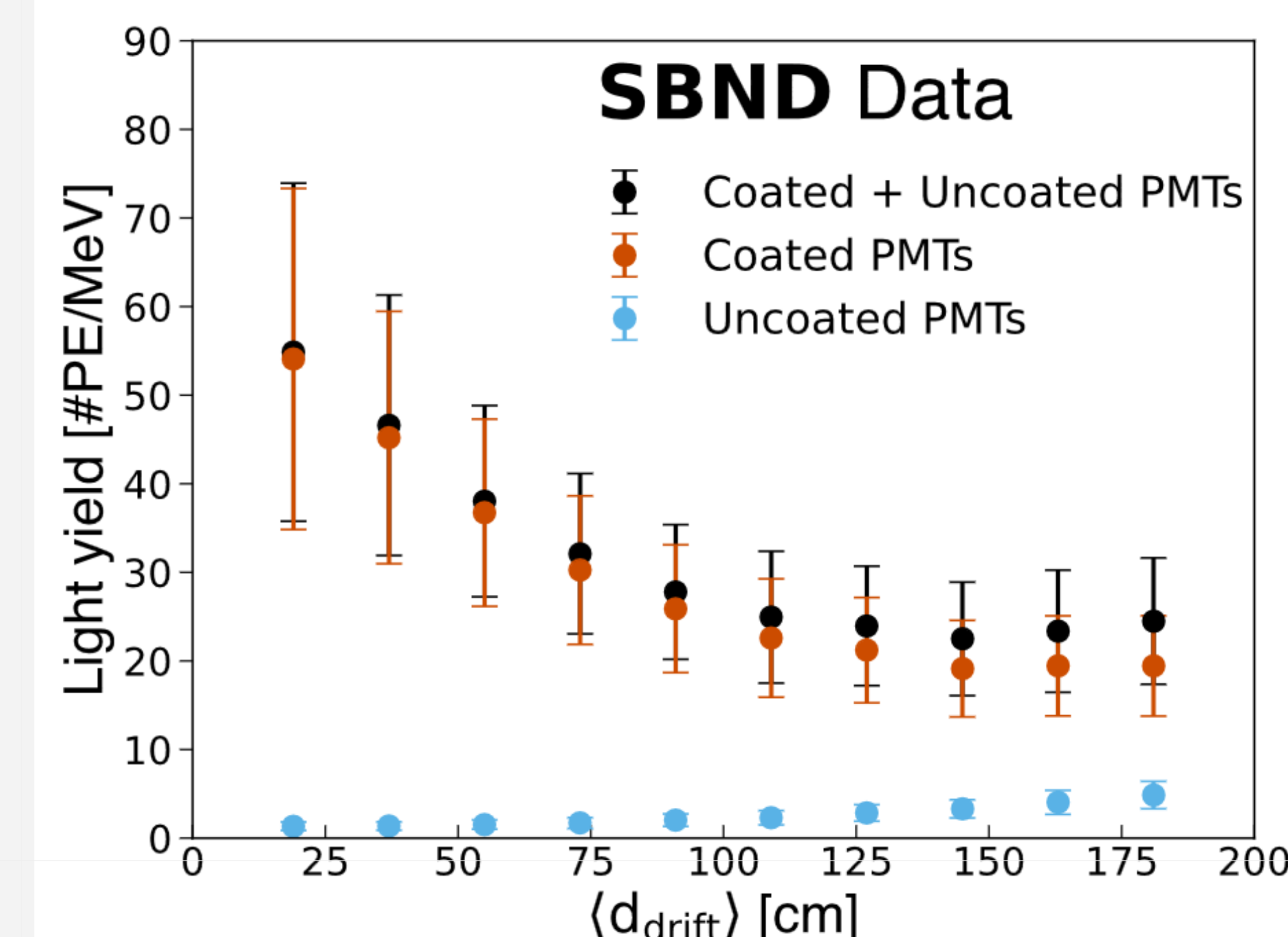
## SBND Analysis in Progress



## 4. Future Work

- Data-MC energy biases are partly understood
  - Updates to data ADC → e- conversion (4% bias)
  - Blips have no flash matching making proper drift corrections difficult (up to 1.5% of bias)
- SBND light trigger settings require 4 PE in 4 PMT pairs making blip light triggers inefficient
  - Irrelevant for neutrino beam-related blips as t0 is known
- Attempts to fit <sup>39</sup>Ar blips are progressing but show strong dependence on threshold and accidental noise coincidence models

### SBND Preliminary



**SBND is well setup for the best keV-MeV scale physics program of any ν-LAr TPC to date**