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# Detector simulation (FLArE)

Jianming Bian, Wenjie Wu

University of California, Irvine

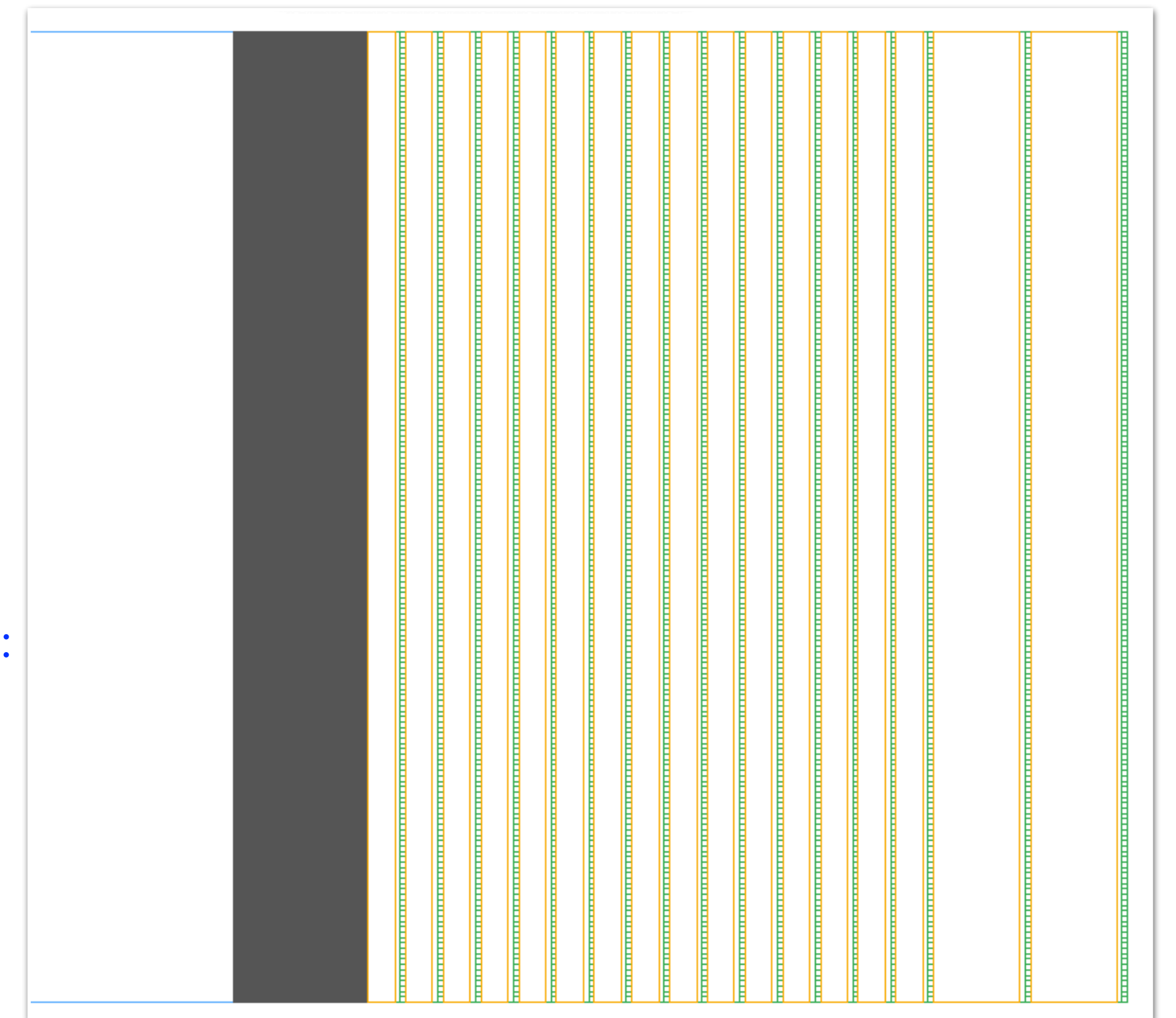
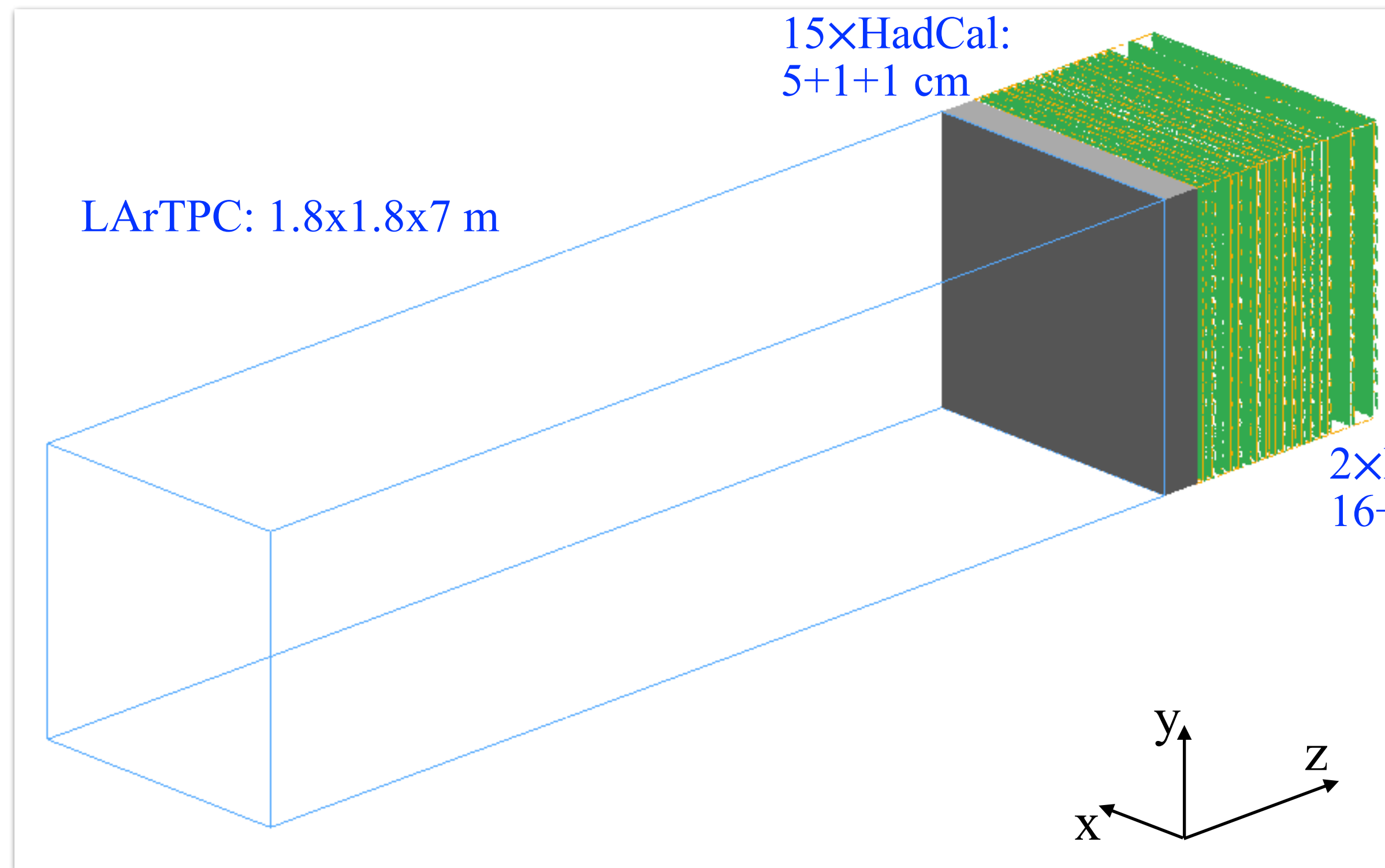
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# Detector configuration in Geant4

	LArTPC	HadCal	MuonFinder
Length (mm)	0 - 7000	7250 - 8300	8300 - 8660



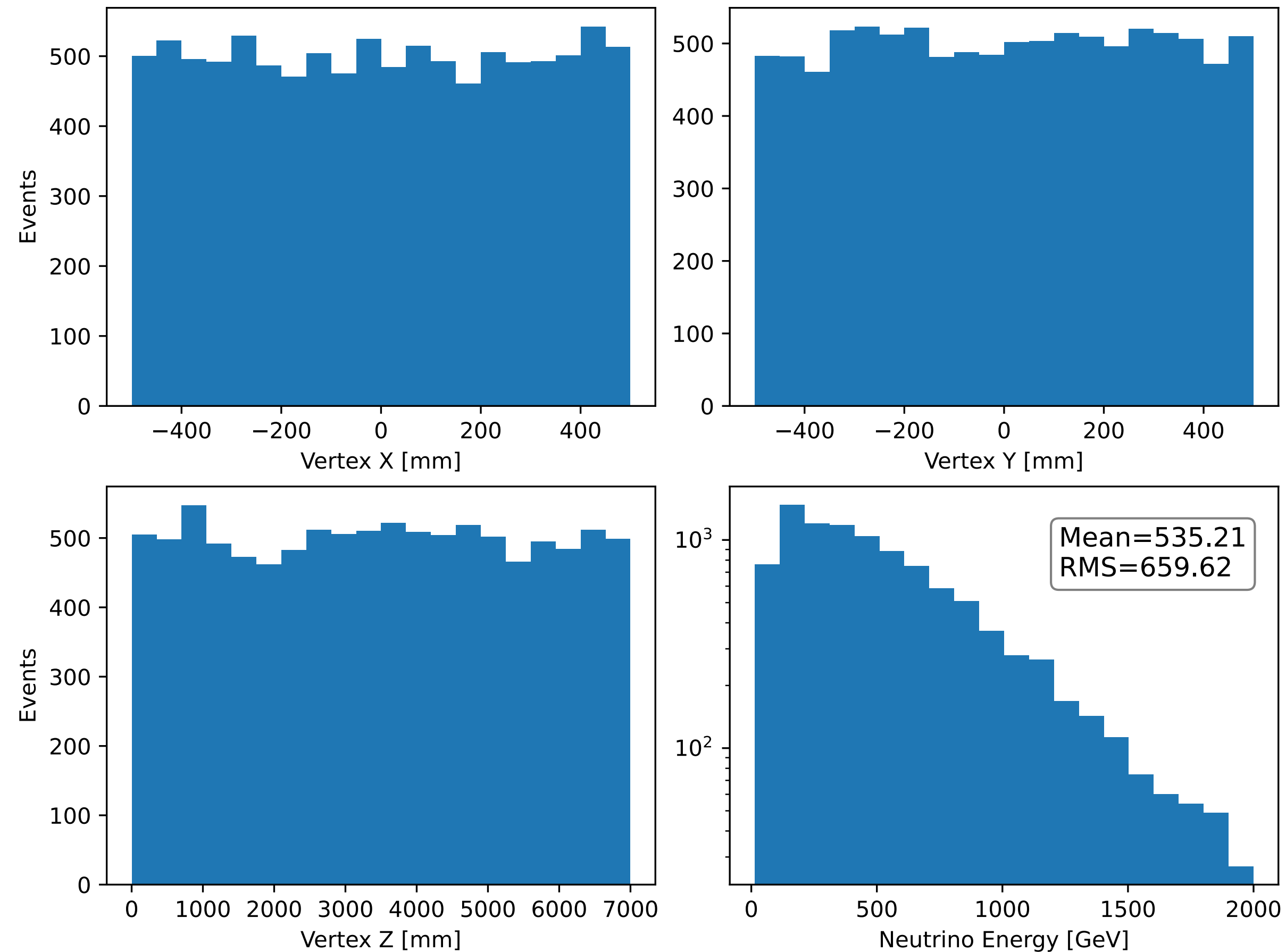
LArTPC

HadCal

MuonFinder

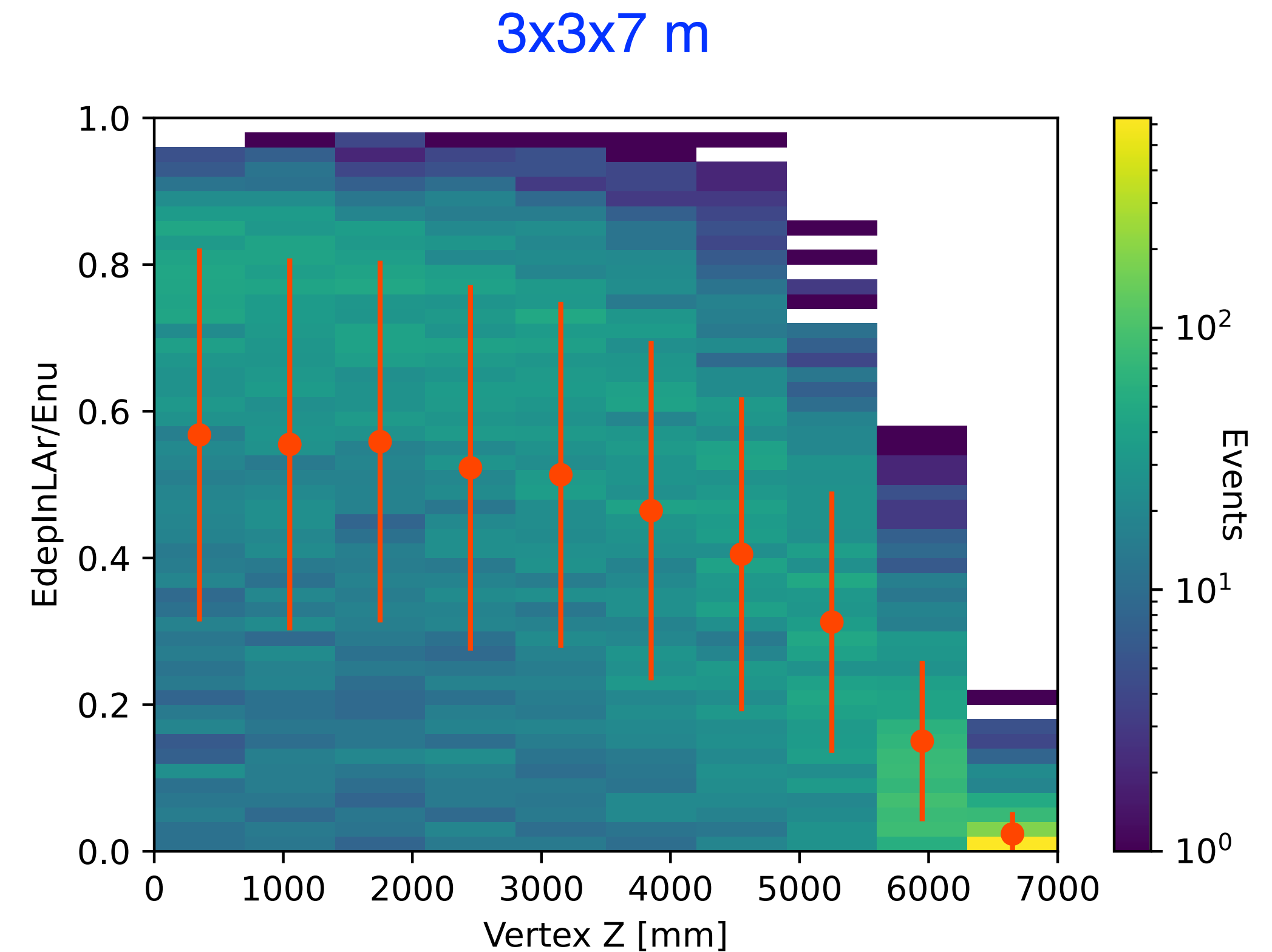
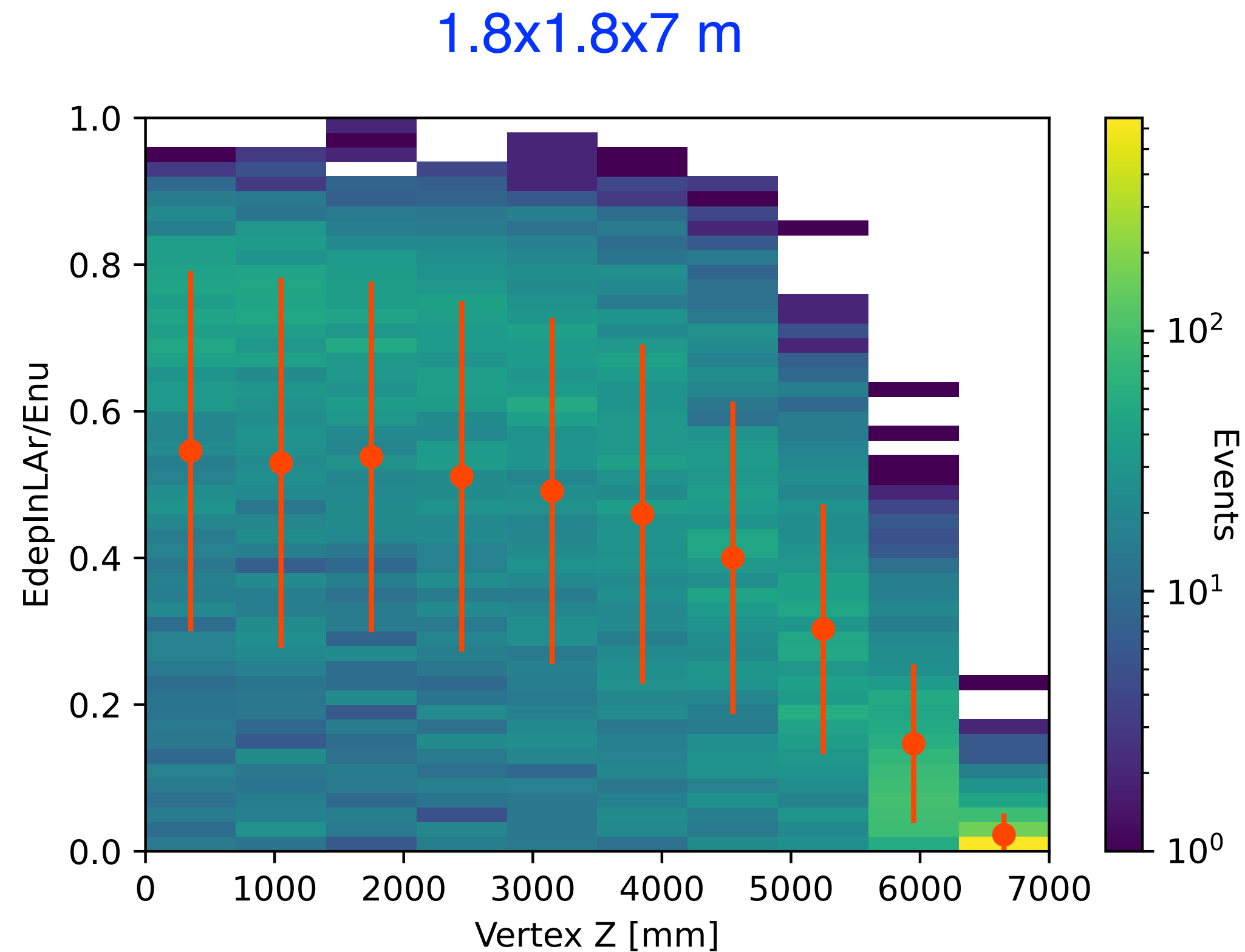
# Assumptions

- The vertices of neutrino interactions are uniformly distributed in the FV region (1x1x7 m)
- No angular smearing for the neutrino beam, all pointed at +z direction



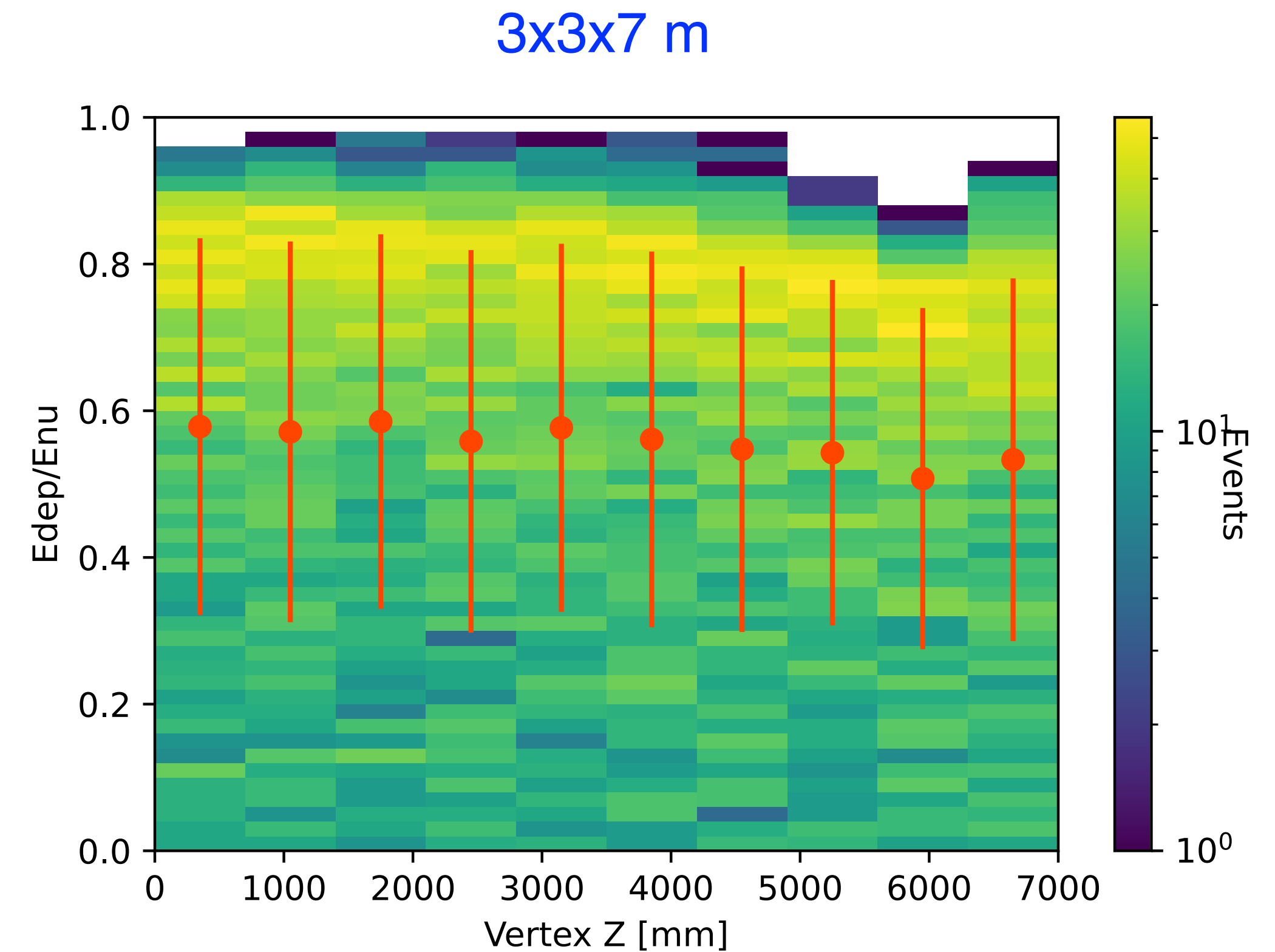
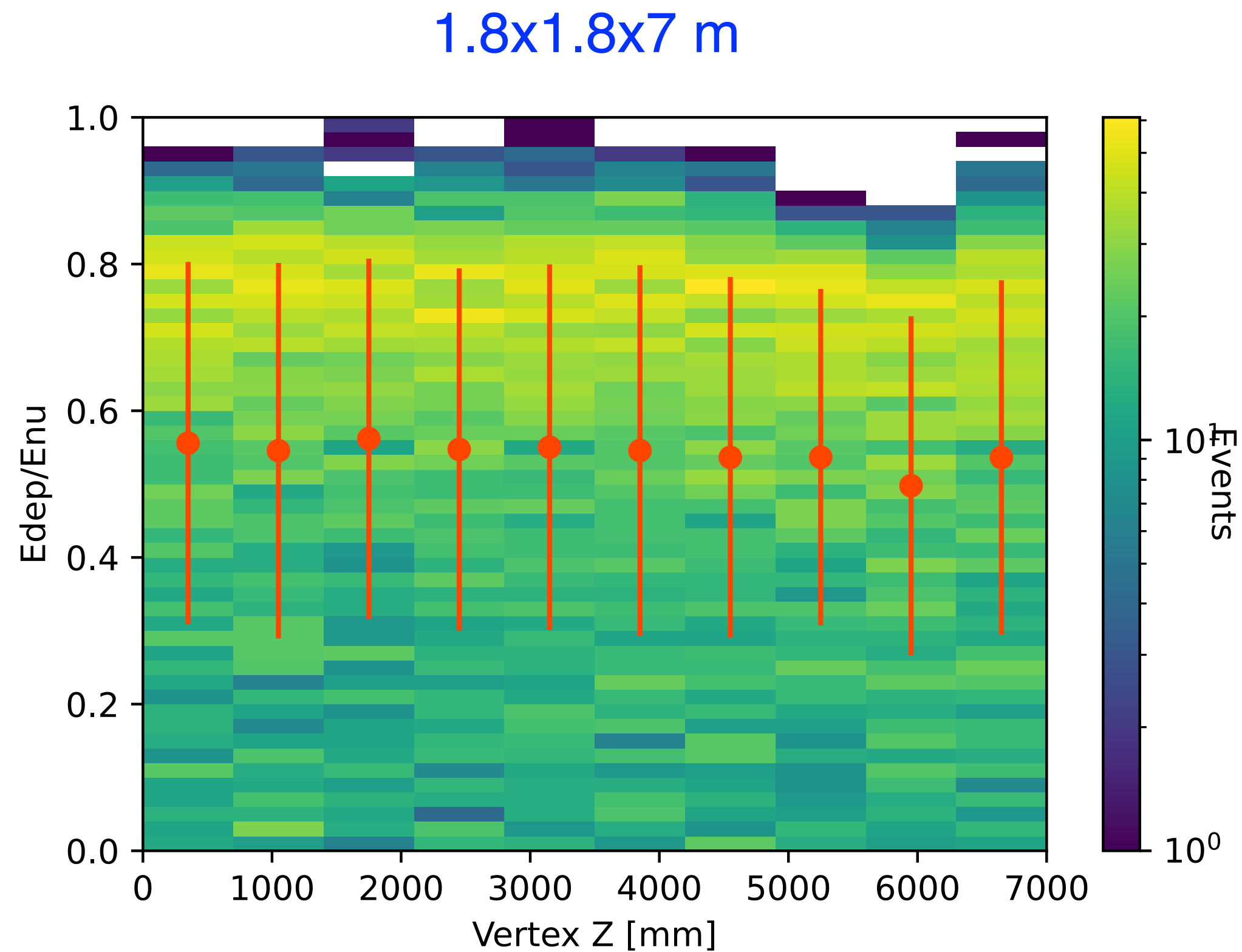
# Energy containment in the LArTPC

- To verify the energy containment in the geometry 1.8x1.8x7
- The ratio of the energy deposited in the LArTPC to the neutrino energy
  - The orange markers are the mean values and standard deviation as error bars

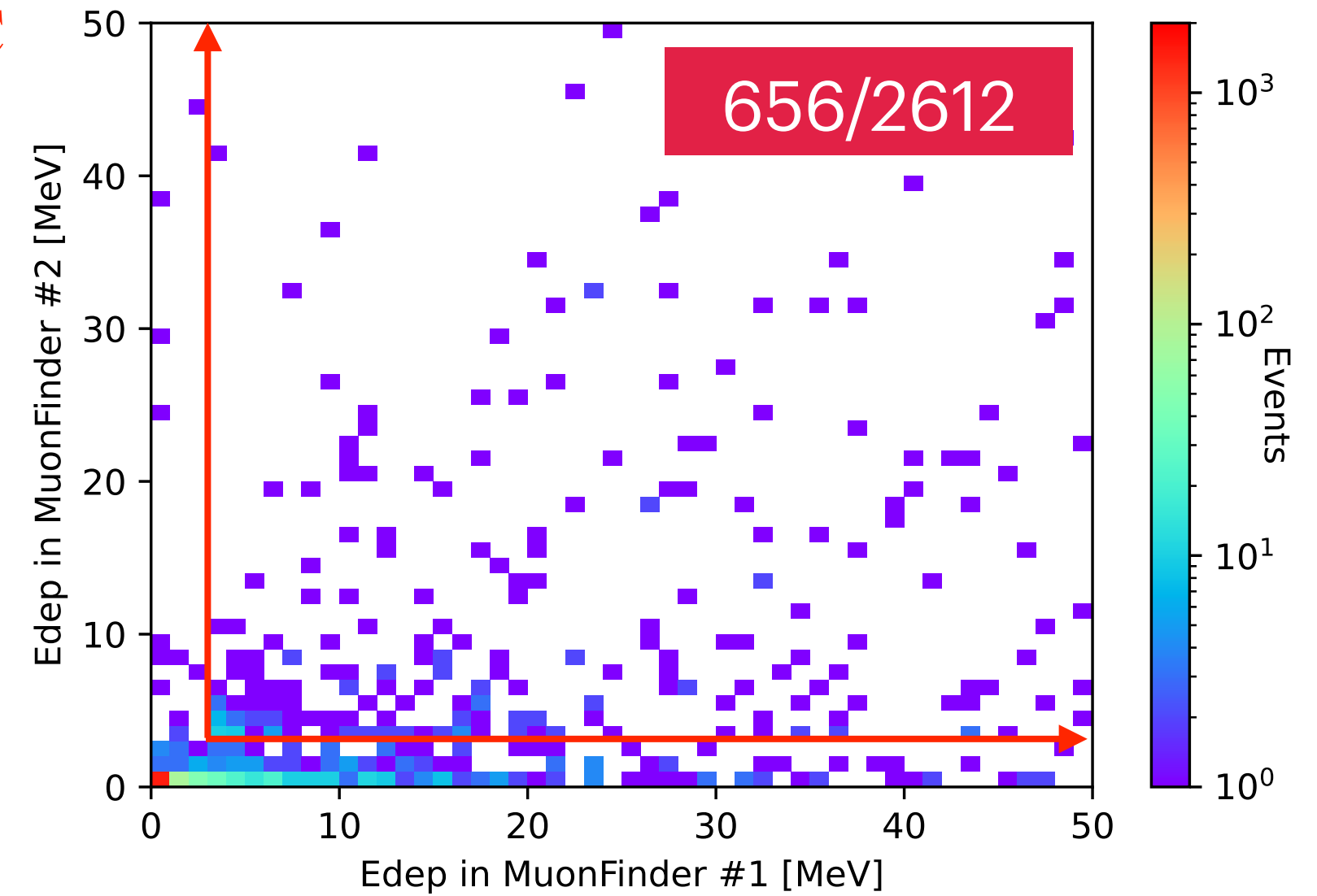
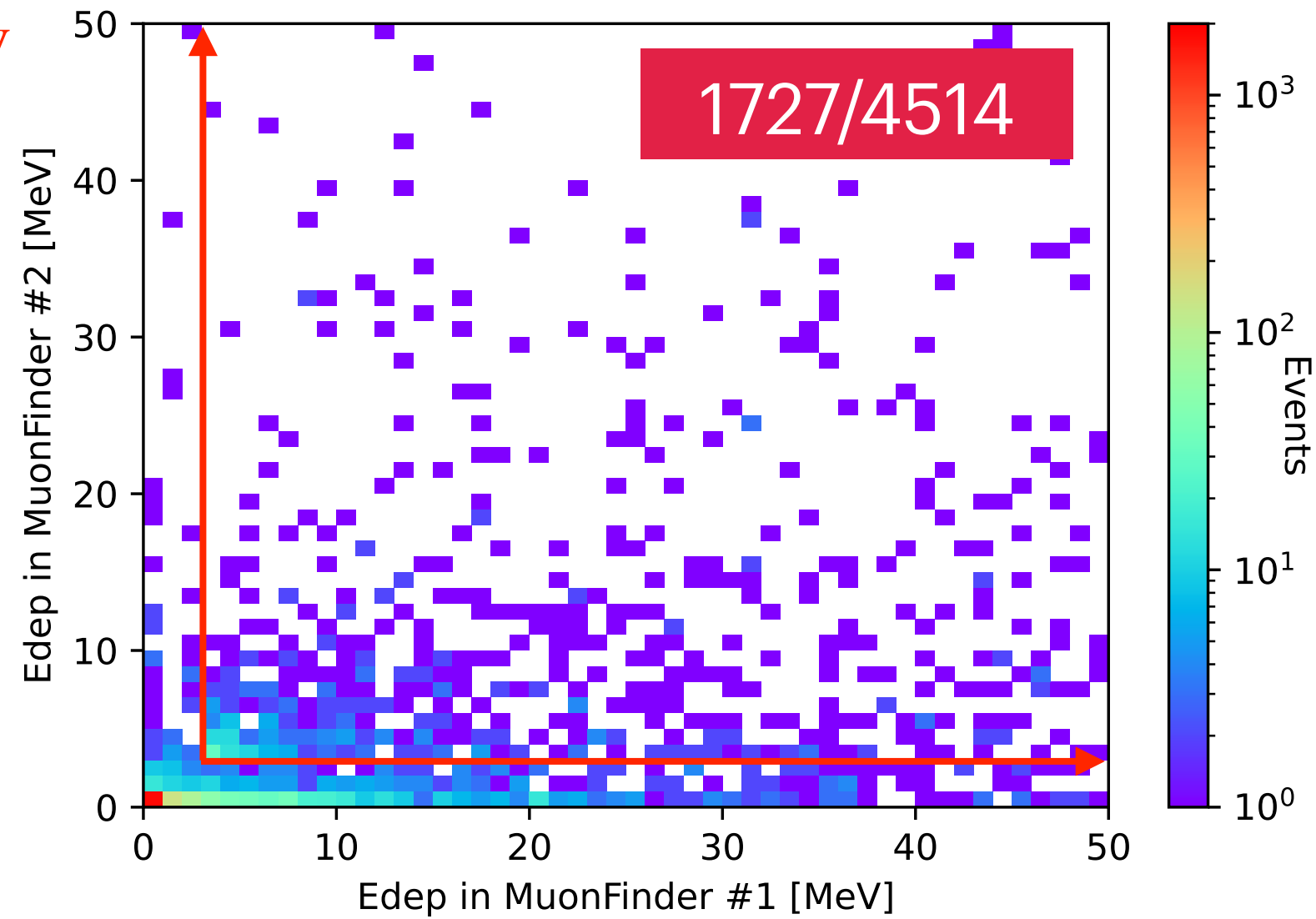
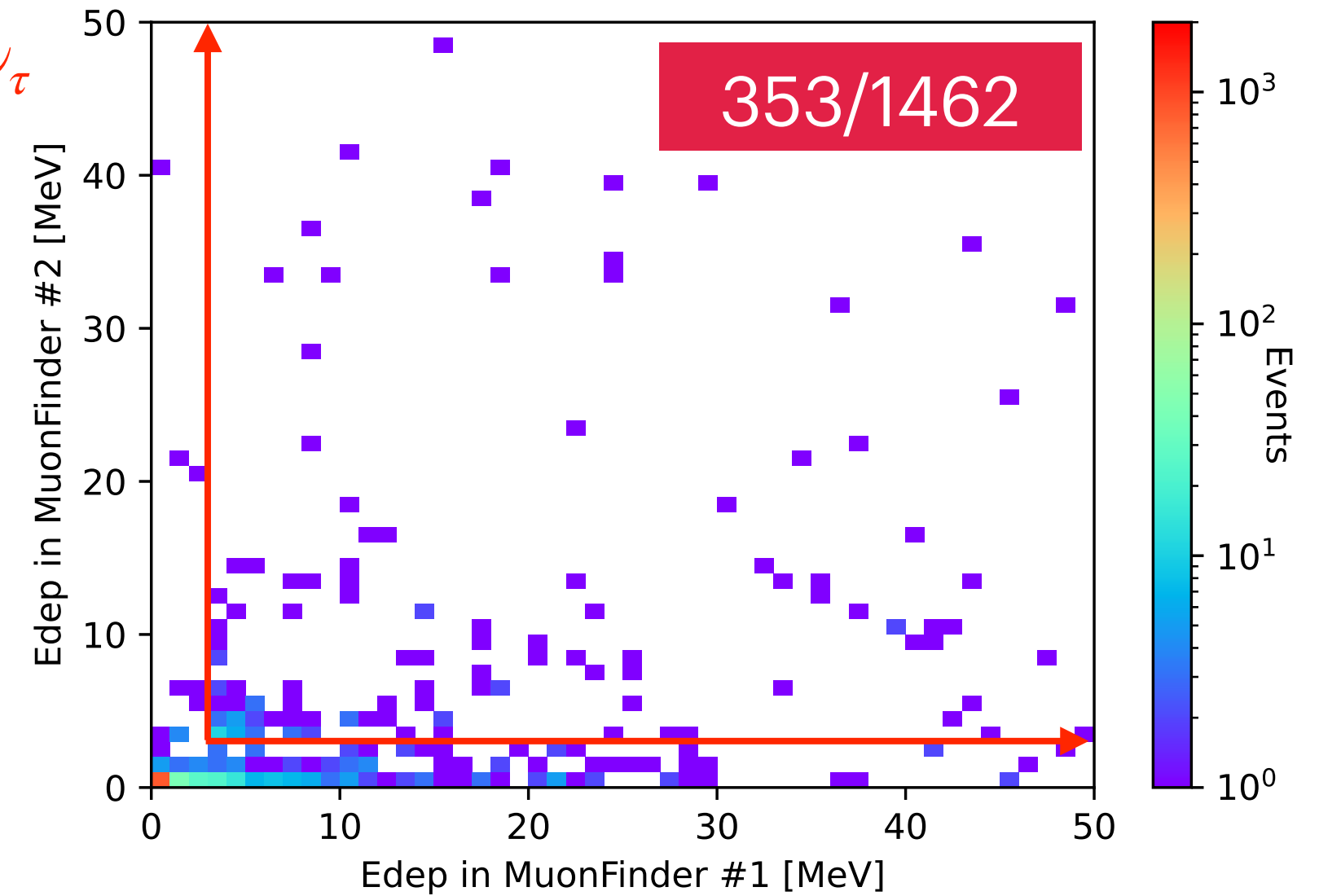
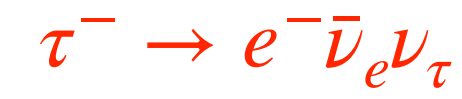
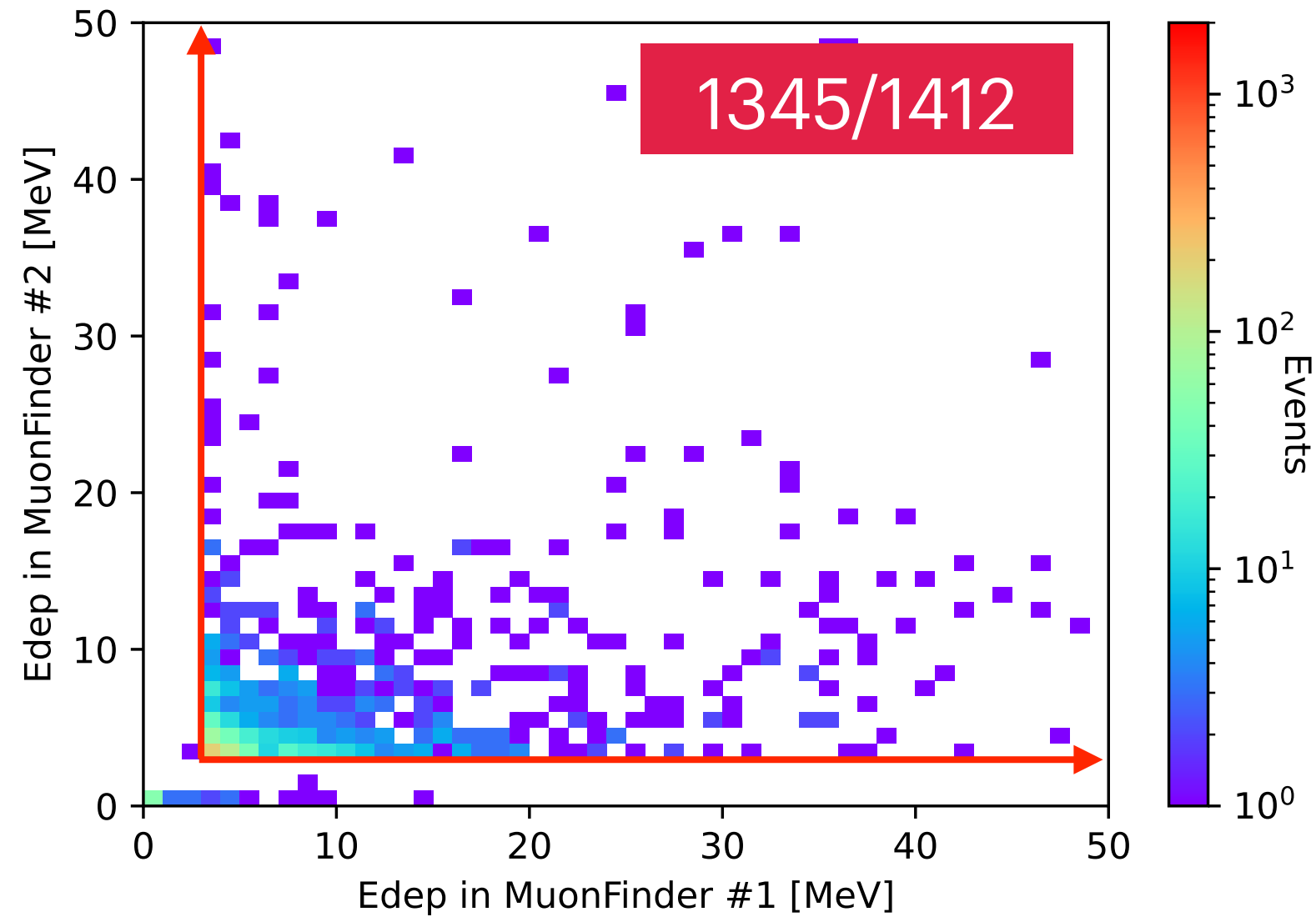
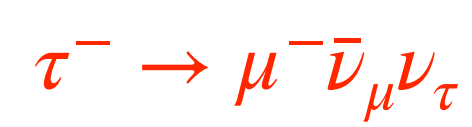


# Energy containment w/ HadCal

- To verify the energy containment in the geometry 1.8x1.8x7
- The ratio of the energy deposited in the (LArTPC+HadCal) to the neutrino energy
  - The orange markers are the mean values and standard deviation as error bars
- The hadCal can save loss energies for events happened in the downstream of the detector



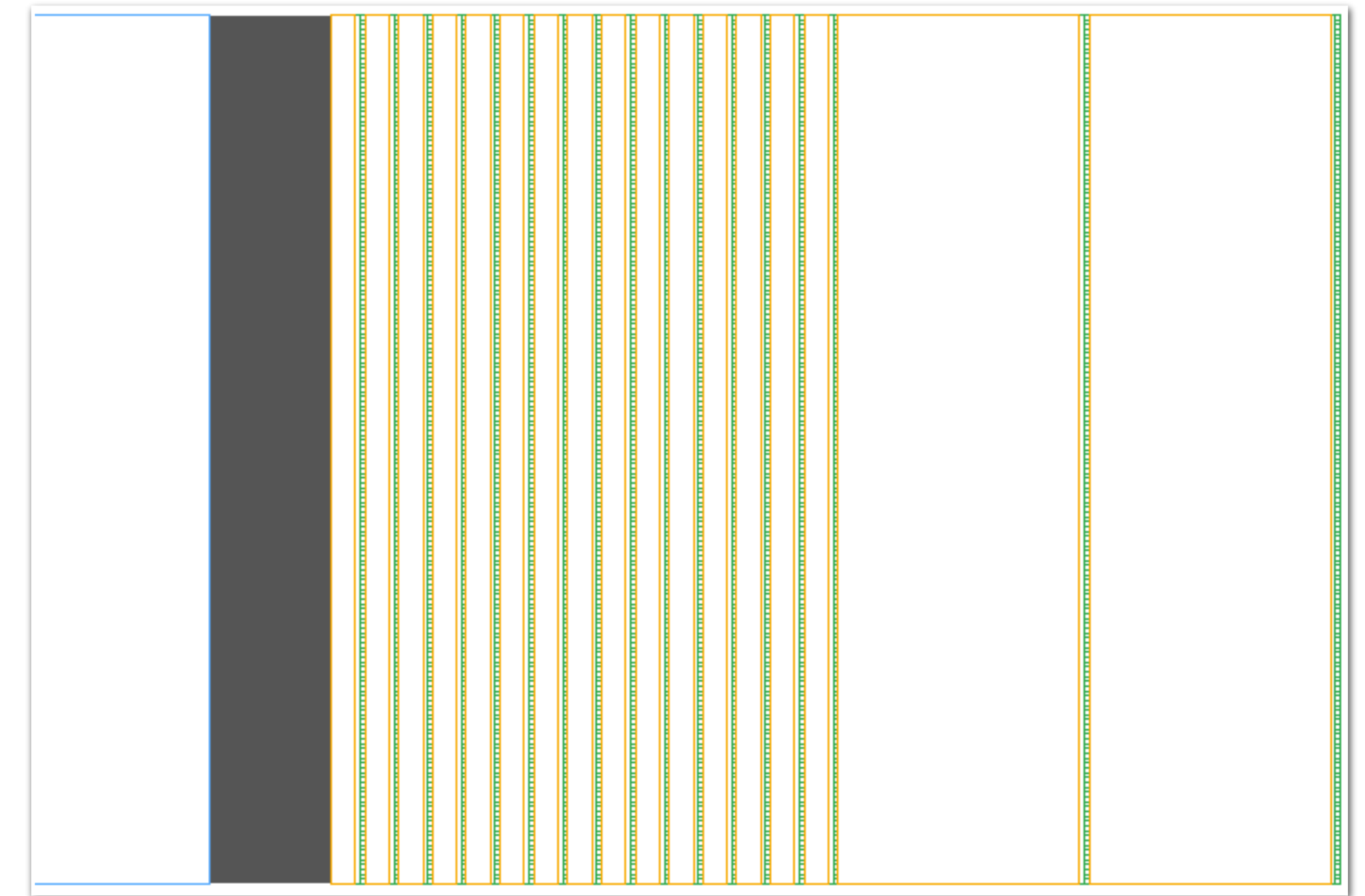
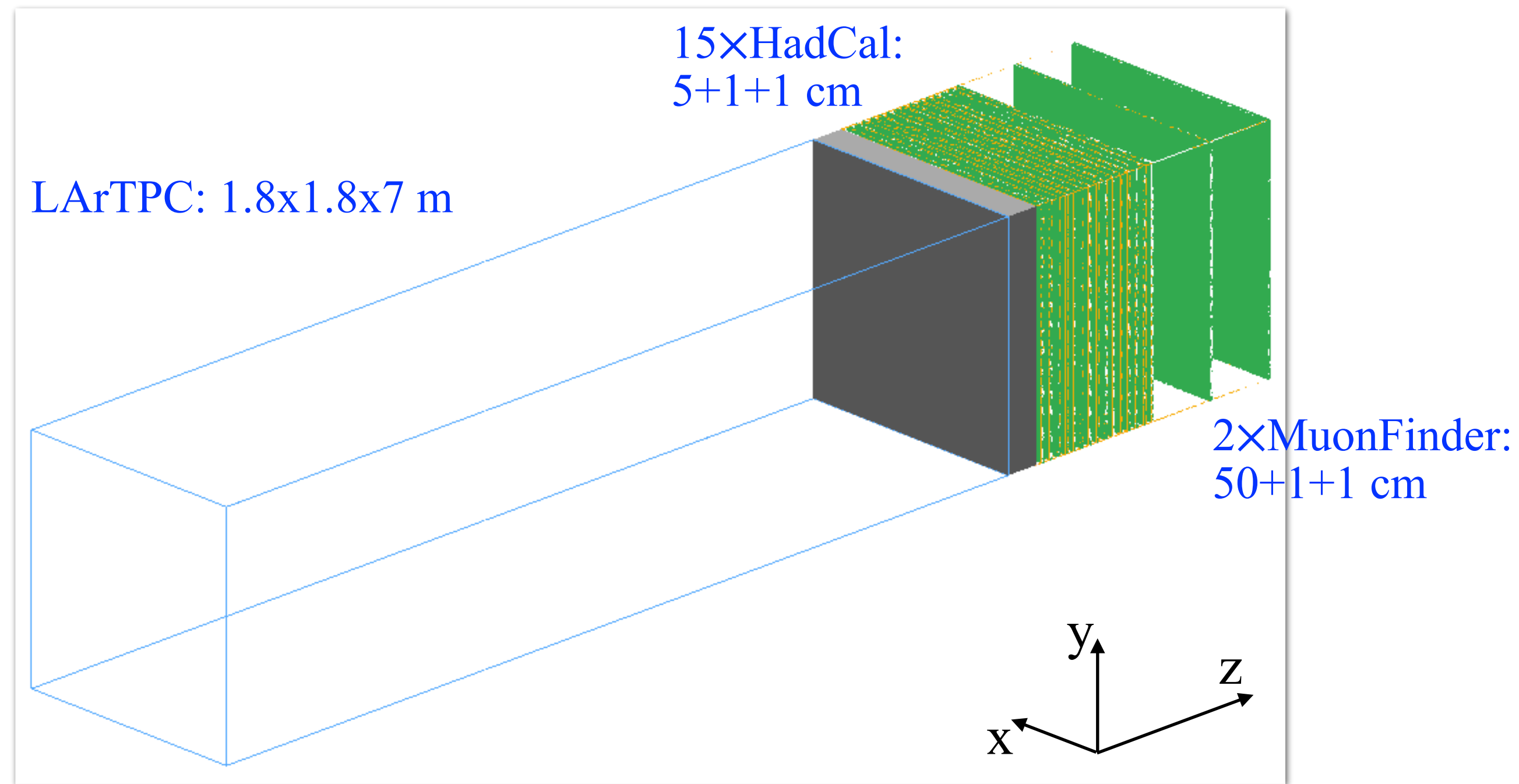
# Deposited energy in MuonFinder





# Detector configuration in Geant4

	LArTPC	HadCal	MuonFinder
Length (mm)	0 - 7000	7250 - 8300	8300 - 9340

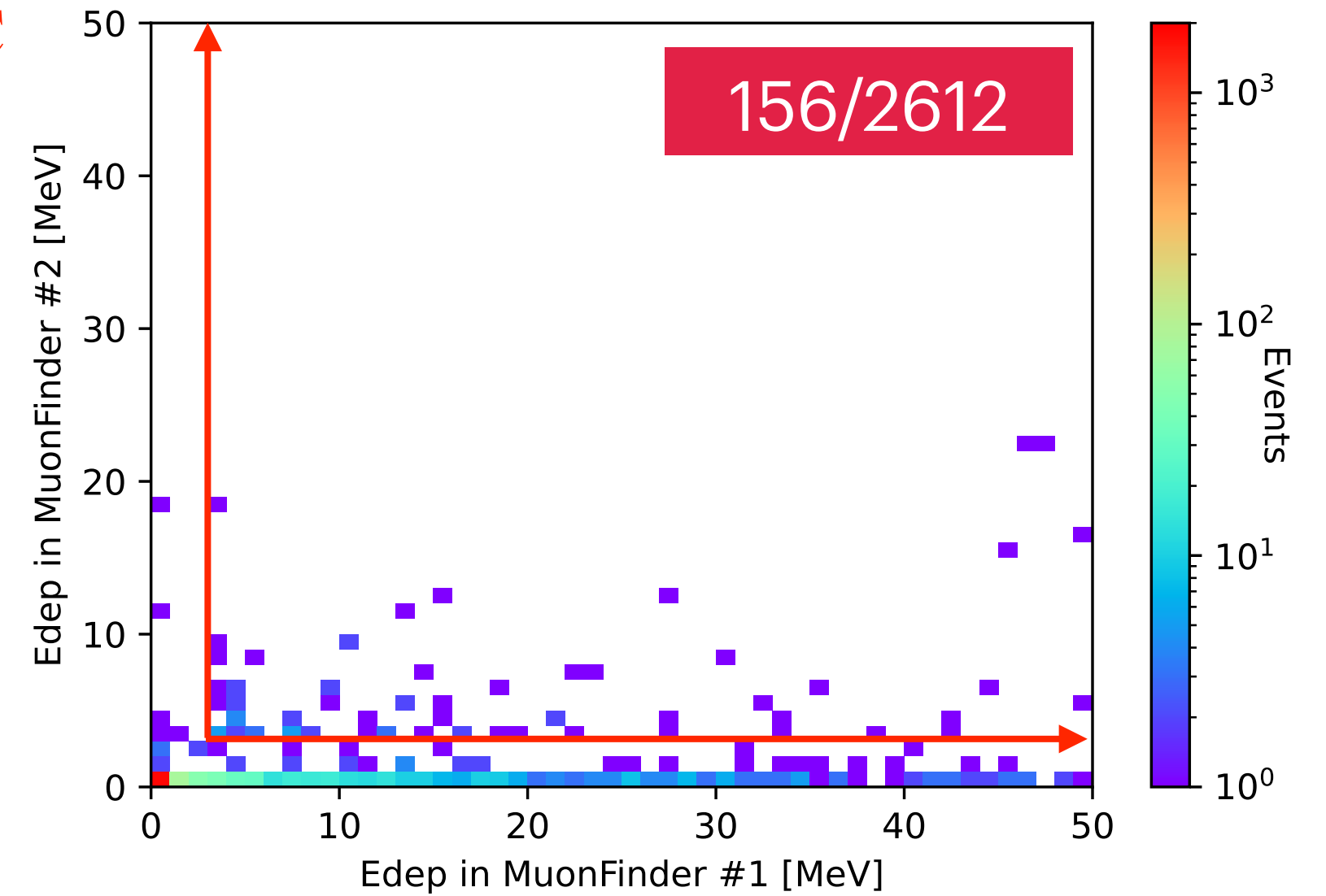
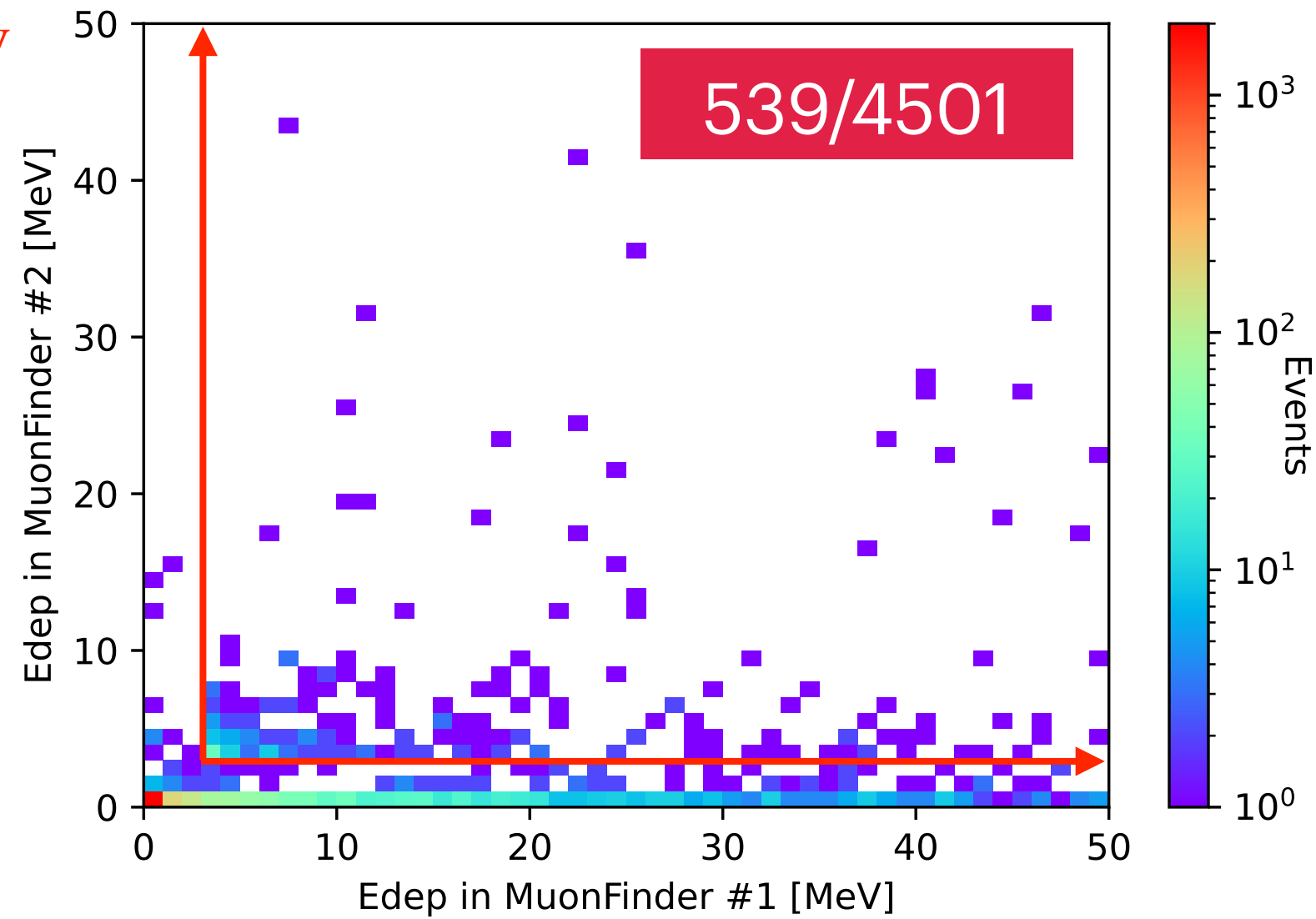
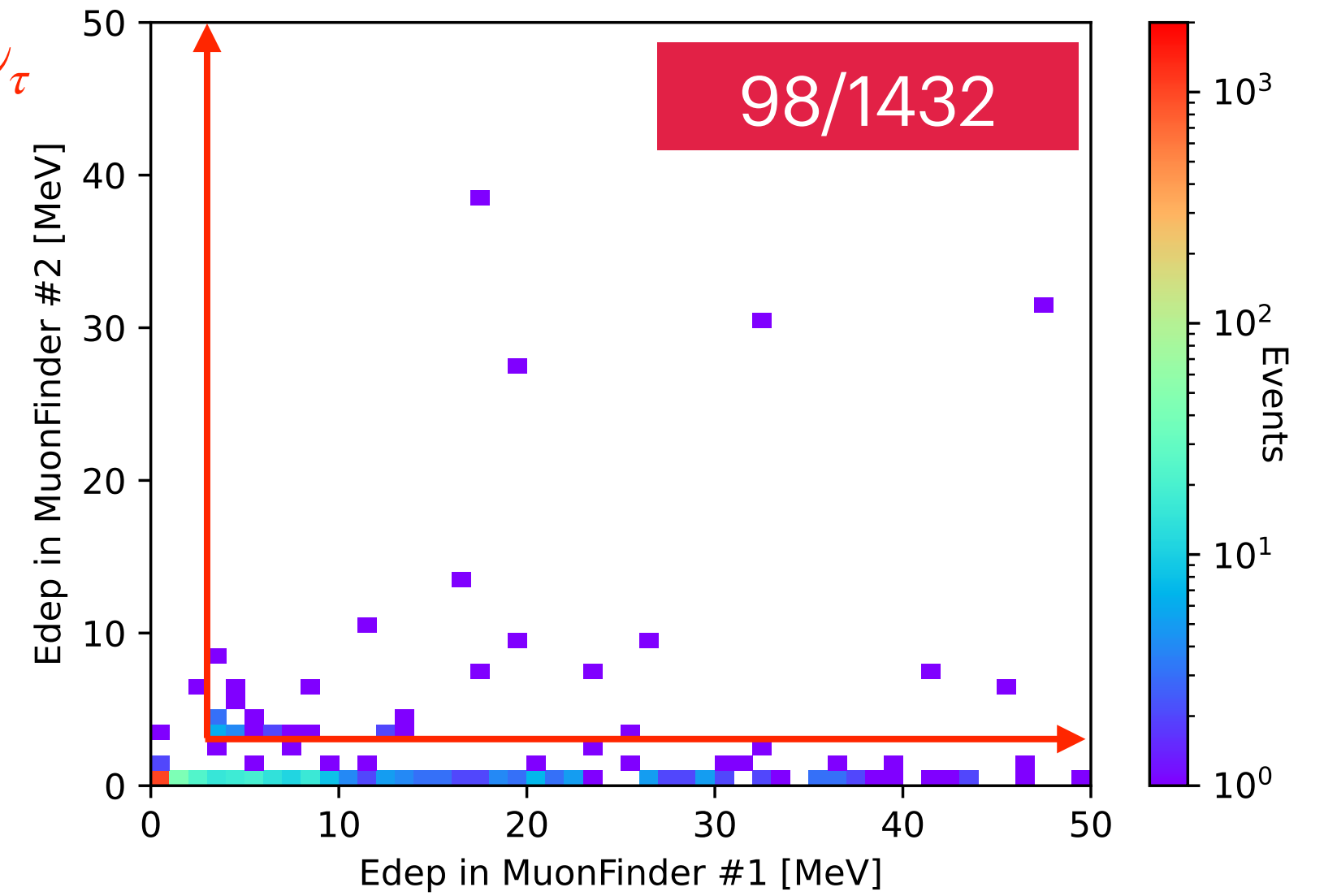
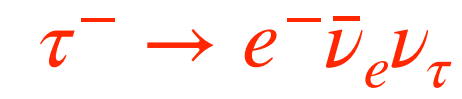
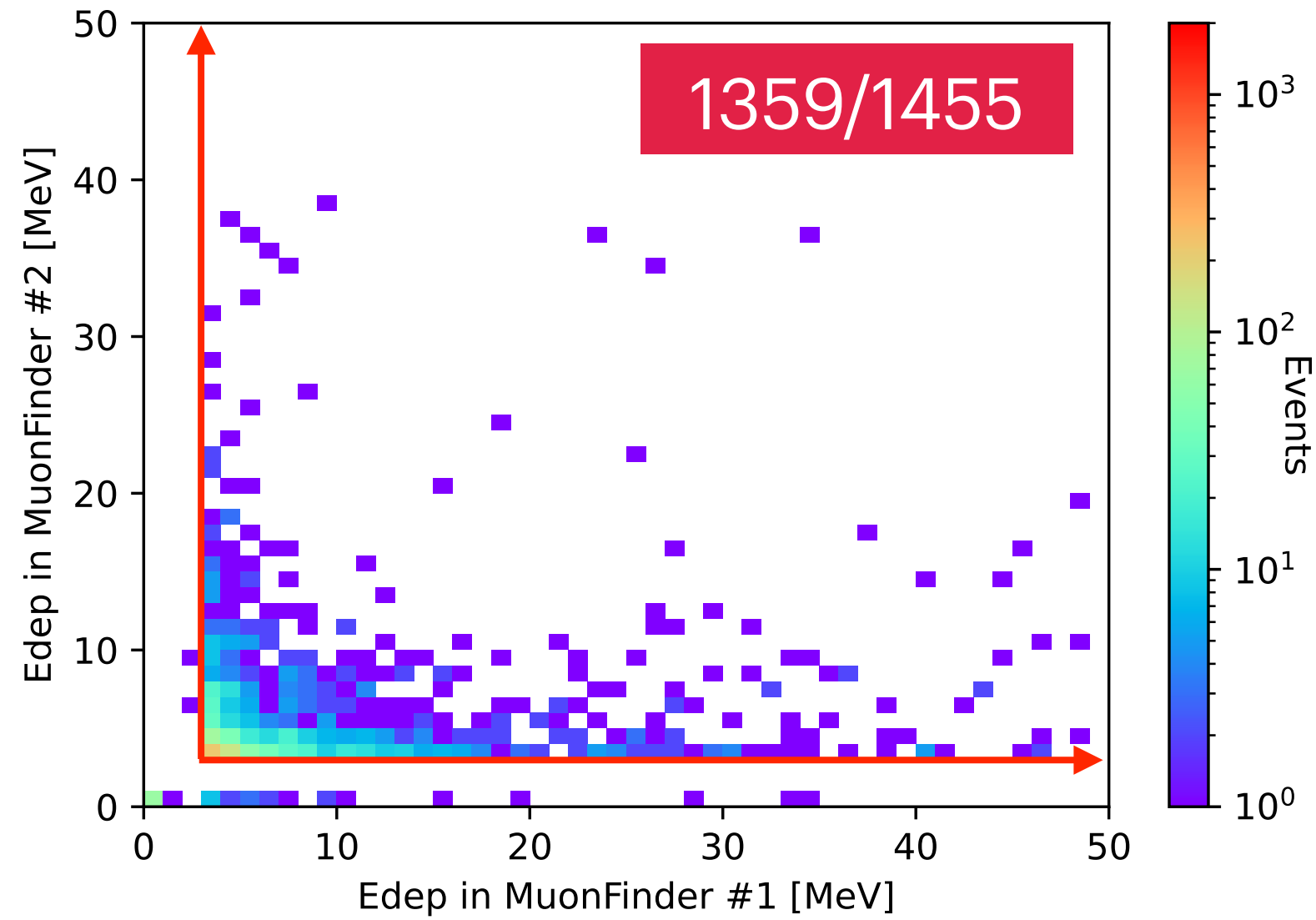
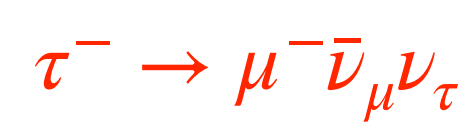


LArTPC

HadCal

MuonFinder

# Deposited energy in MuonFinder





# Work in progress

- Save all the hit information from G4 simulation
  - As the energy is very high, there is a large amount of hits for each event (~TB for 10000 neutrino events)
- Will do more analysis on the new MC data
  - Study the feature of all stable final state particles from the neutrino interaction
  - Event classification, background rejection

