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Generating ATM nu Events in dunetpc

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Generating the Events

- Tingjun and I created fcl files to generate events in LarSoft (it calls GENIE as the generator)
- Main file in:
`/dunetpc/srcs/dunetpc/fcl/dunefd/gen/atm`
- After generation, one can run the usual reconstruction chain:
 - g4
 - detsim
 - reco
 - anatree

Generating the Events

- There are already 100 events in:
`/dune/app/users/santucci/dunetpc/jobs/output/atmnu/
prodgenie_atmnu_dune10kt_workspace_gen_g4_detsi
m_reco.root`
- or `nue.root` for anatree file

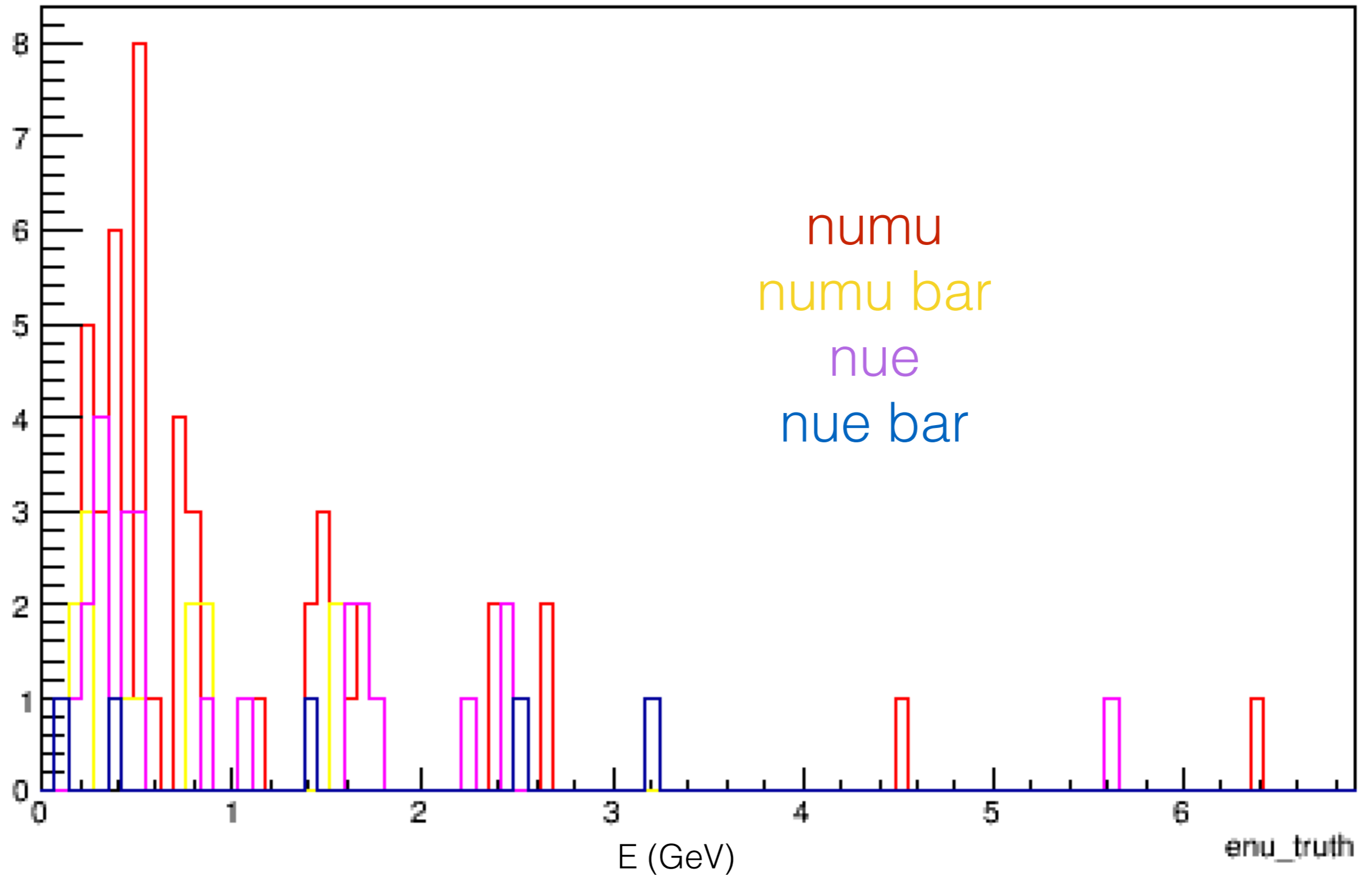
Necessary changes

- To generate new files it is necessary to provide flux files as input
- We got the files from:
<http://www-pnp.physics.ox.ac.uk/~barr/fluxfiles/0401/index.html>
- One file per flavor (ν_e , anti- ν_e , ν_μ , anti- ν_μ)
- These were generated for Soudan (MINOS)

Necessary changes

- To use new flux files, change:
`/dunetpc/srcs/dunetpc/dune/EventGenerator/GENIE/genie_dune.fcl`
- In the product: `dune_fd_genie_atm_flux`, one has to change the `FluxSearchPaths` parameter for the location of the flux files
- And the `FluxFiles` parameter for the names of all the files used

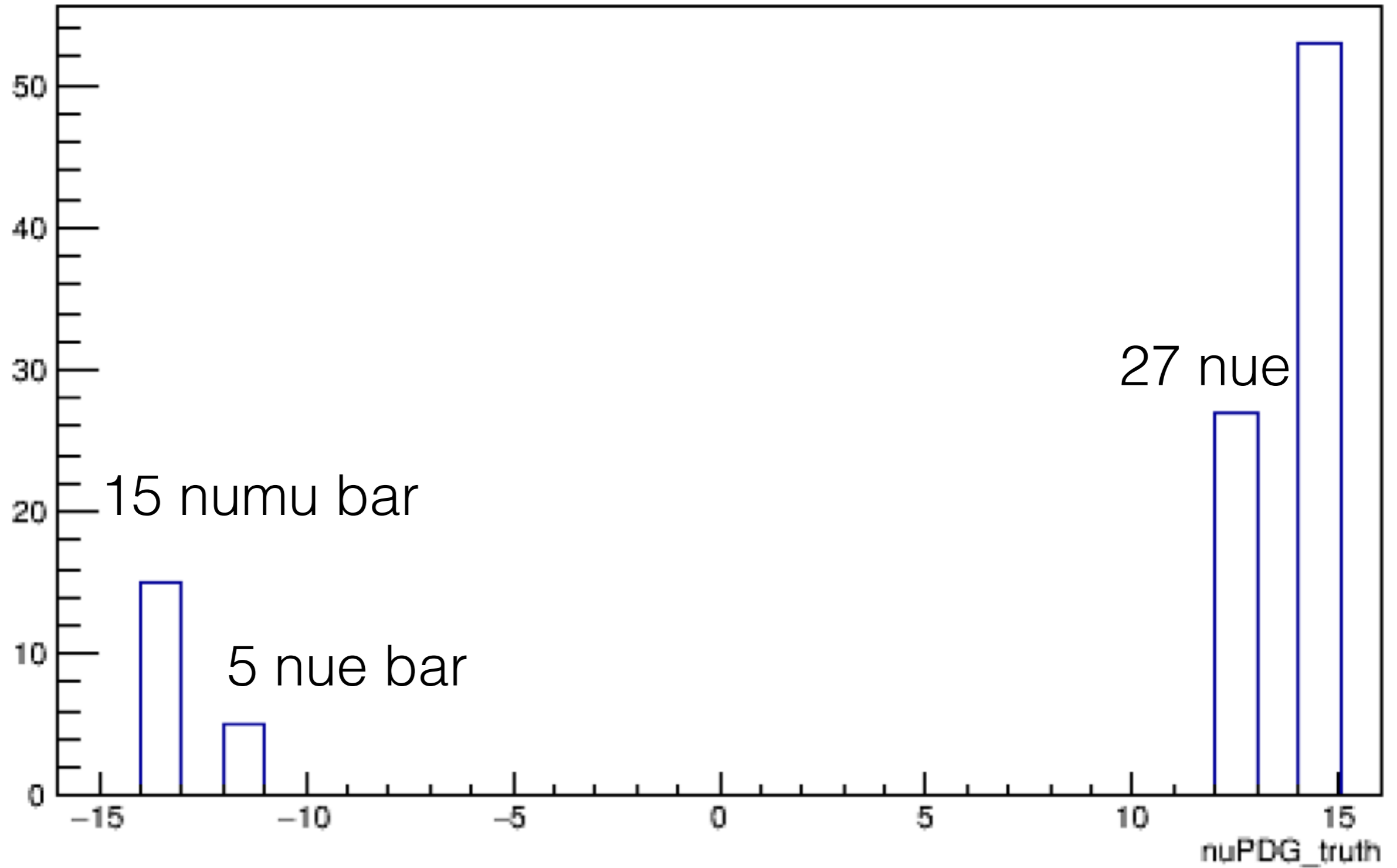
Energy Distributions



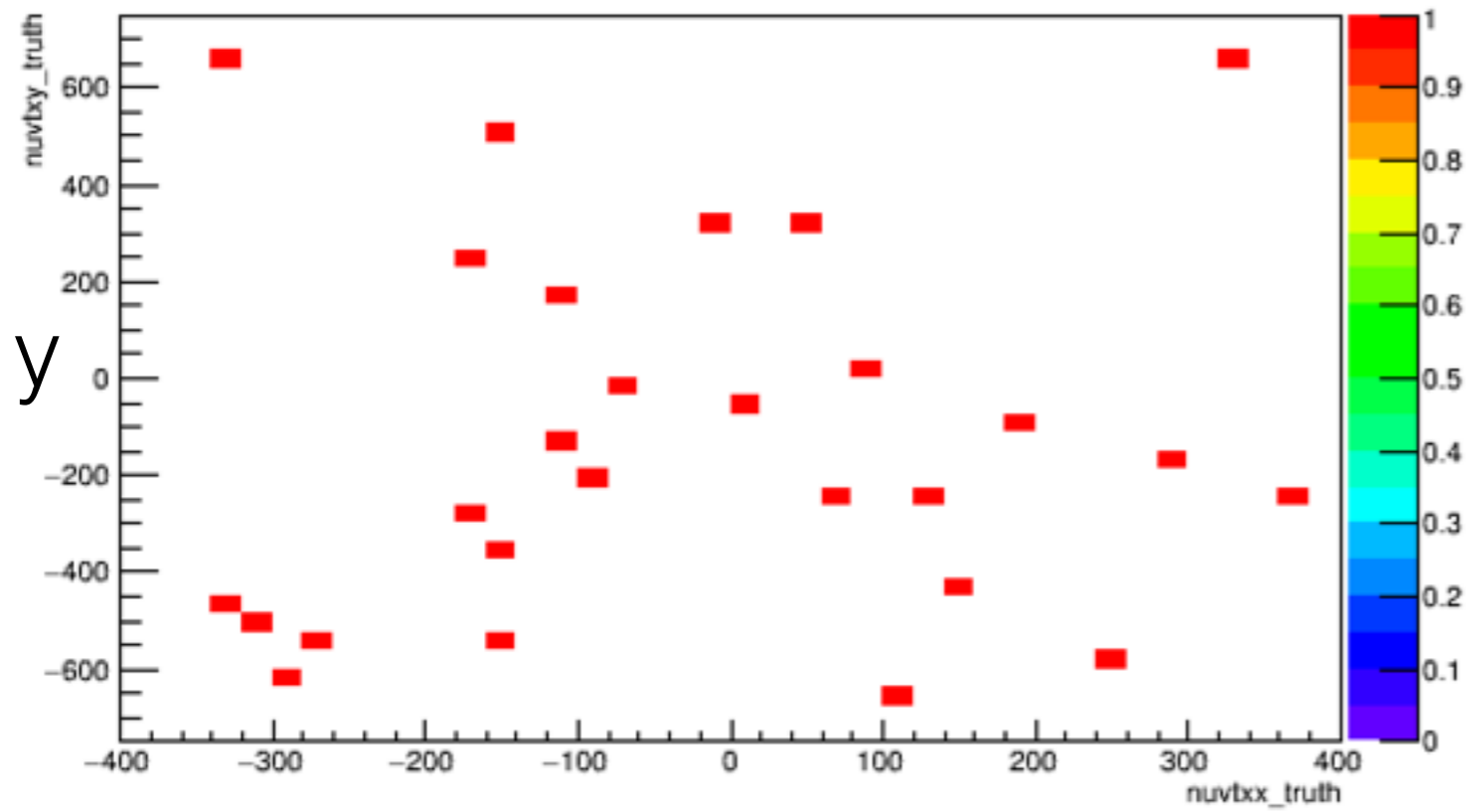
Flavor

nuPDG_truth

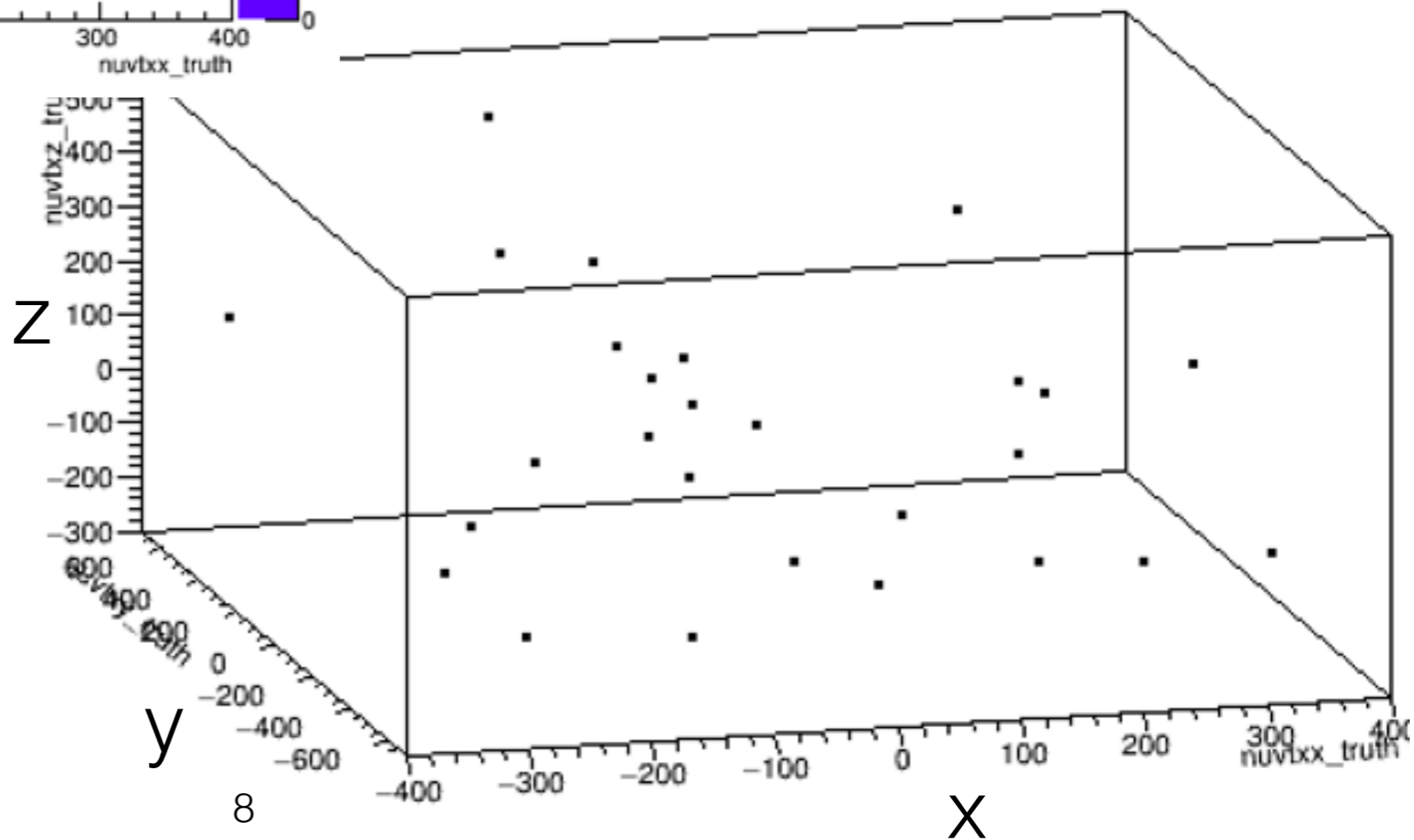
53 numu



Position Distributions



X



8

X