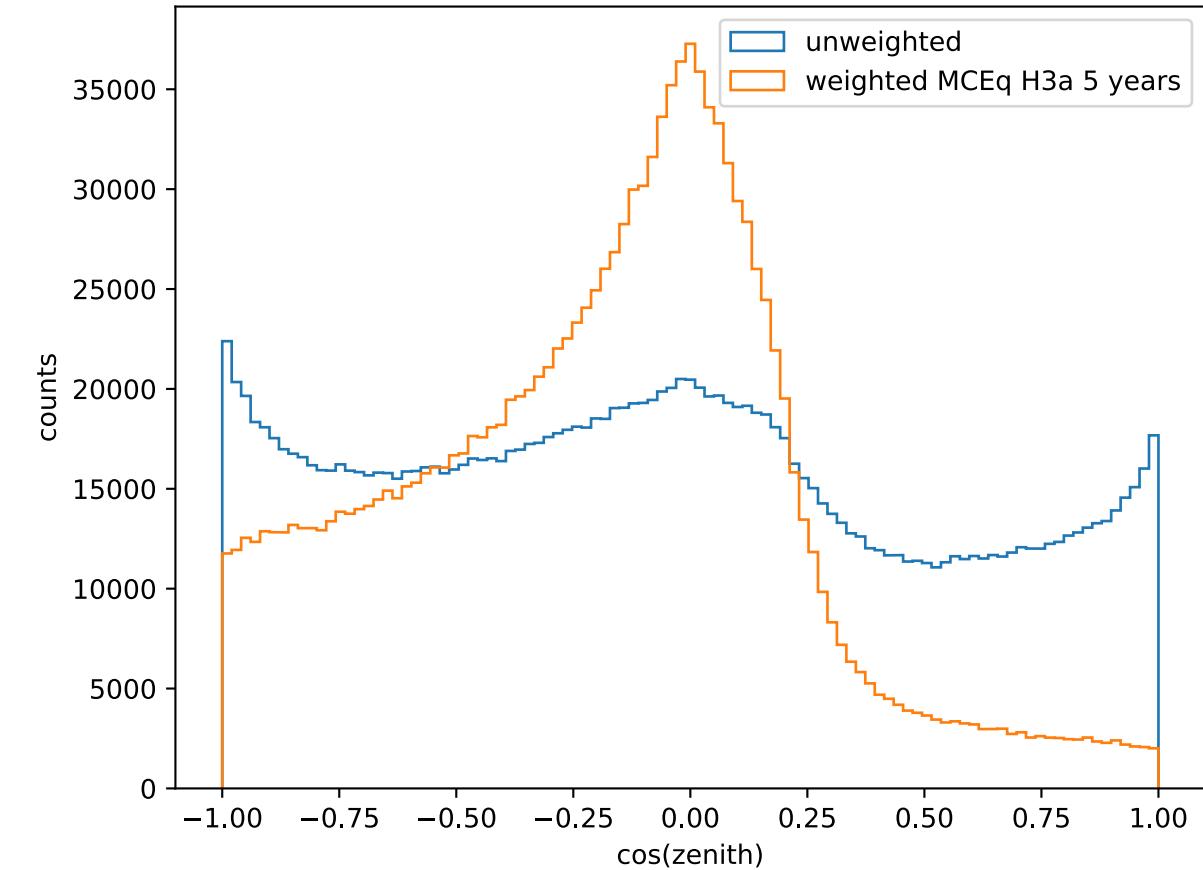
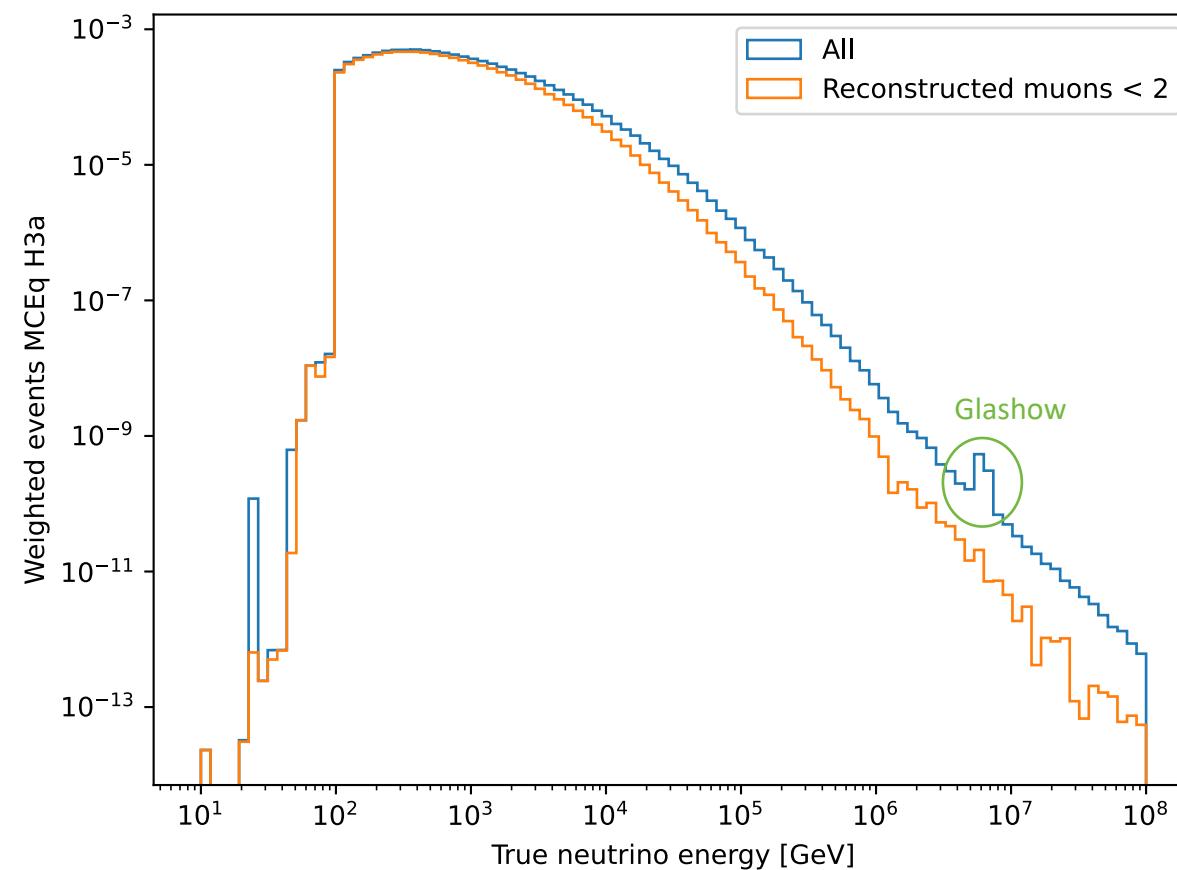


Multiplicity reconstruction

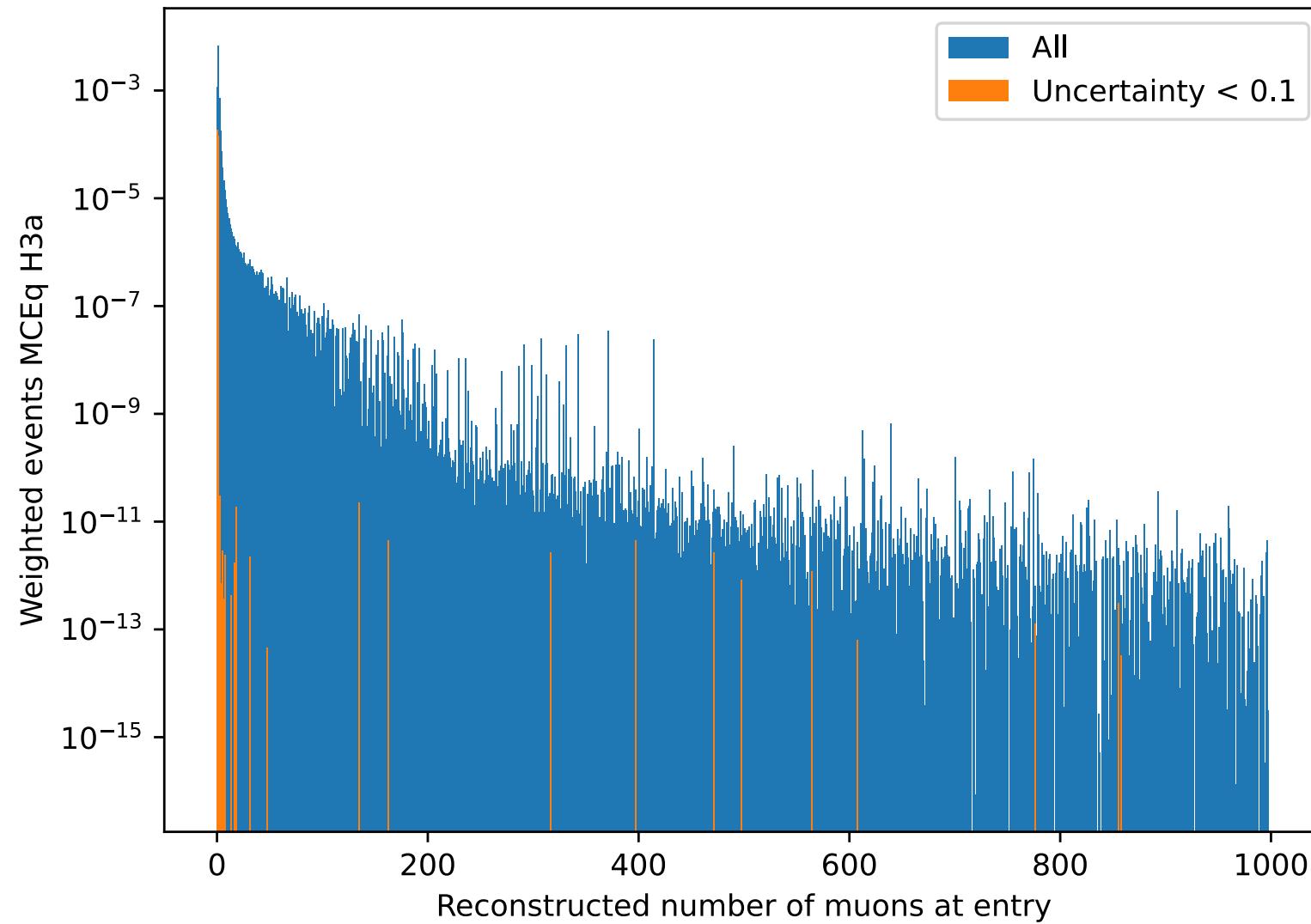
Pascal Gutjahr

NuGen – dataset exploration

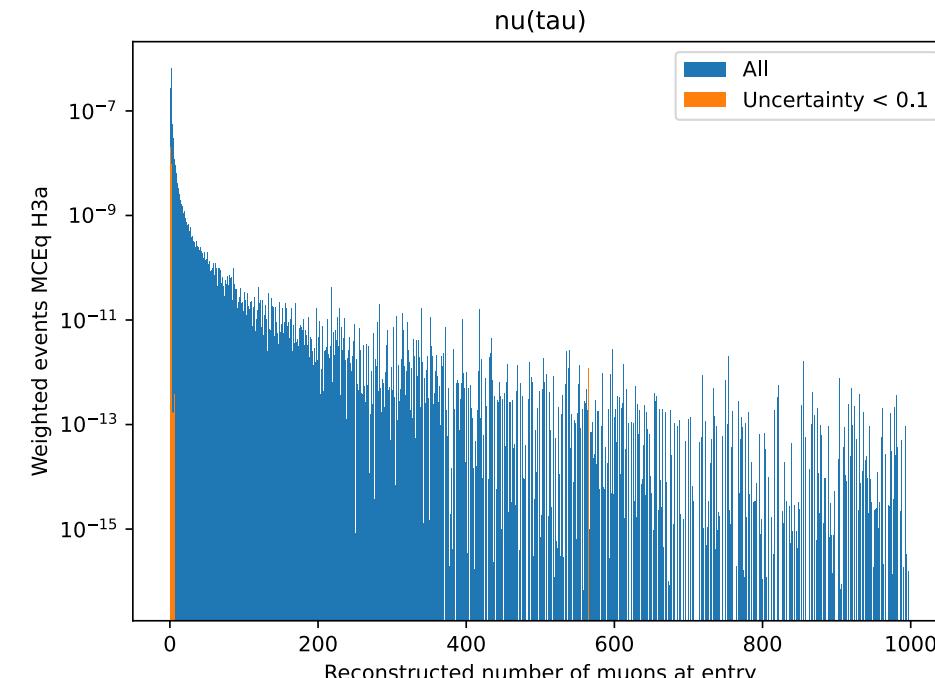
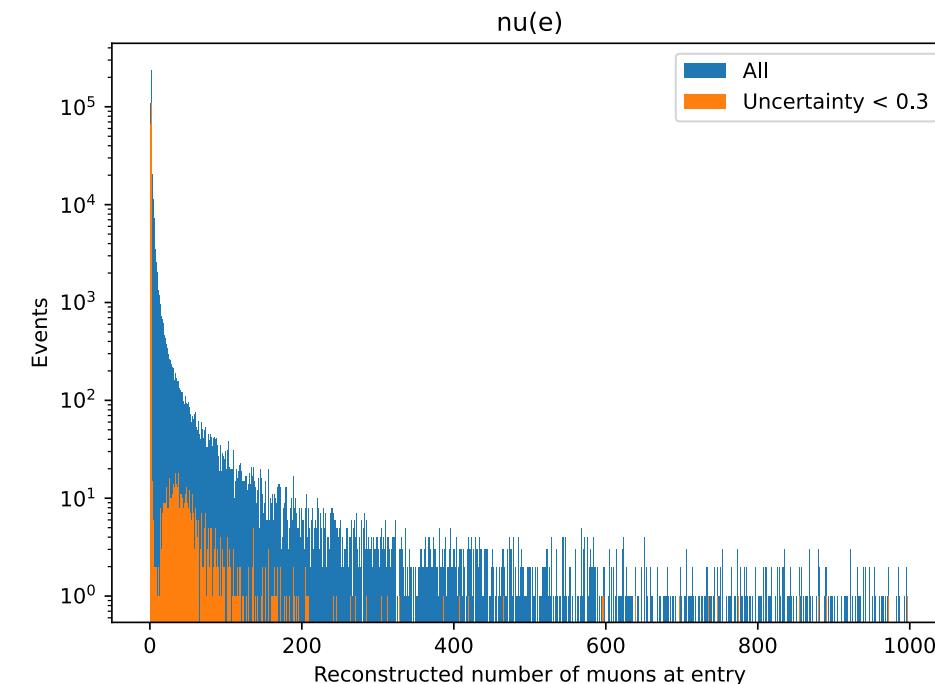
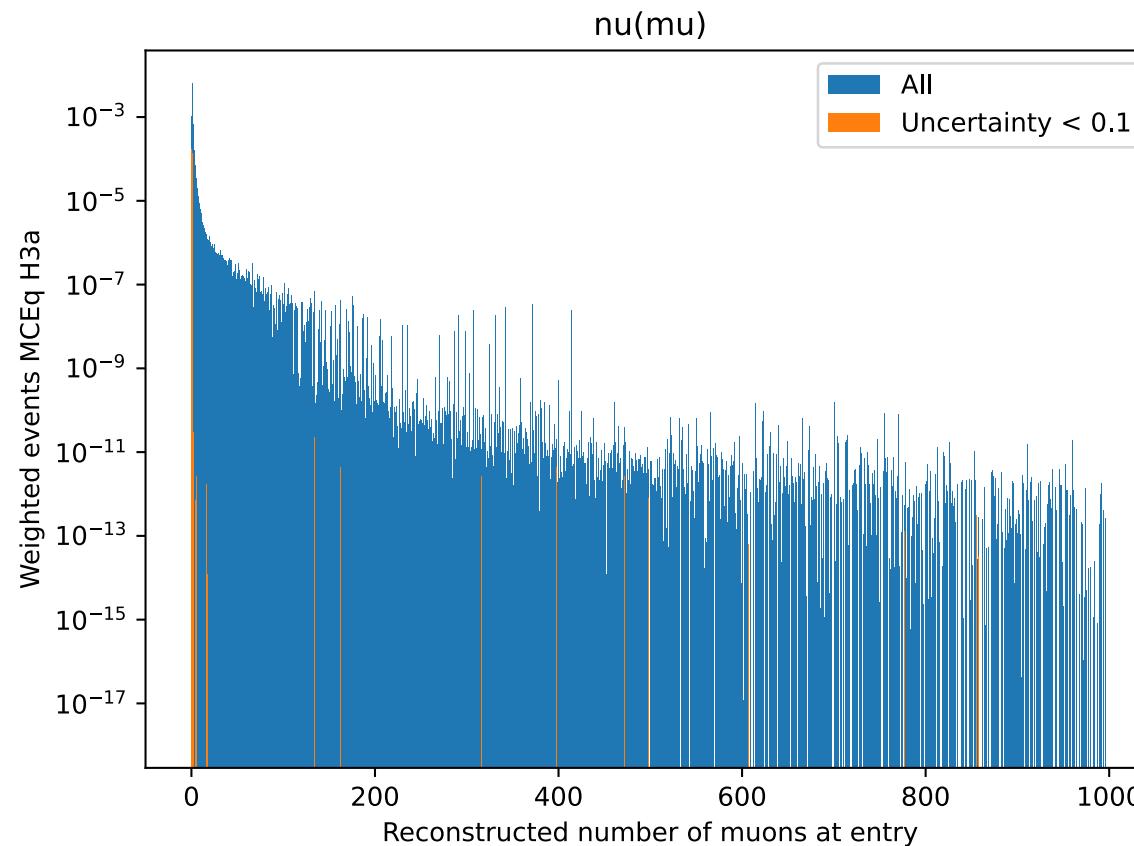


NuGen – Multiplicity reconstruction

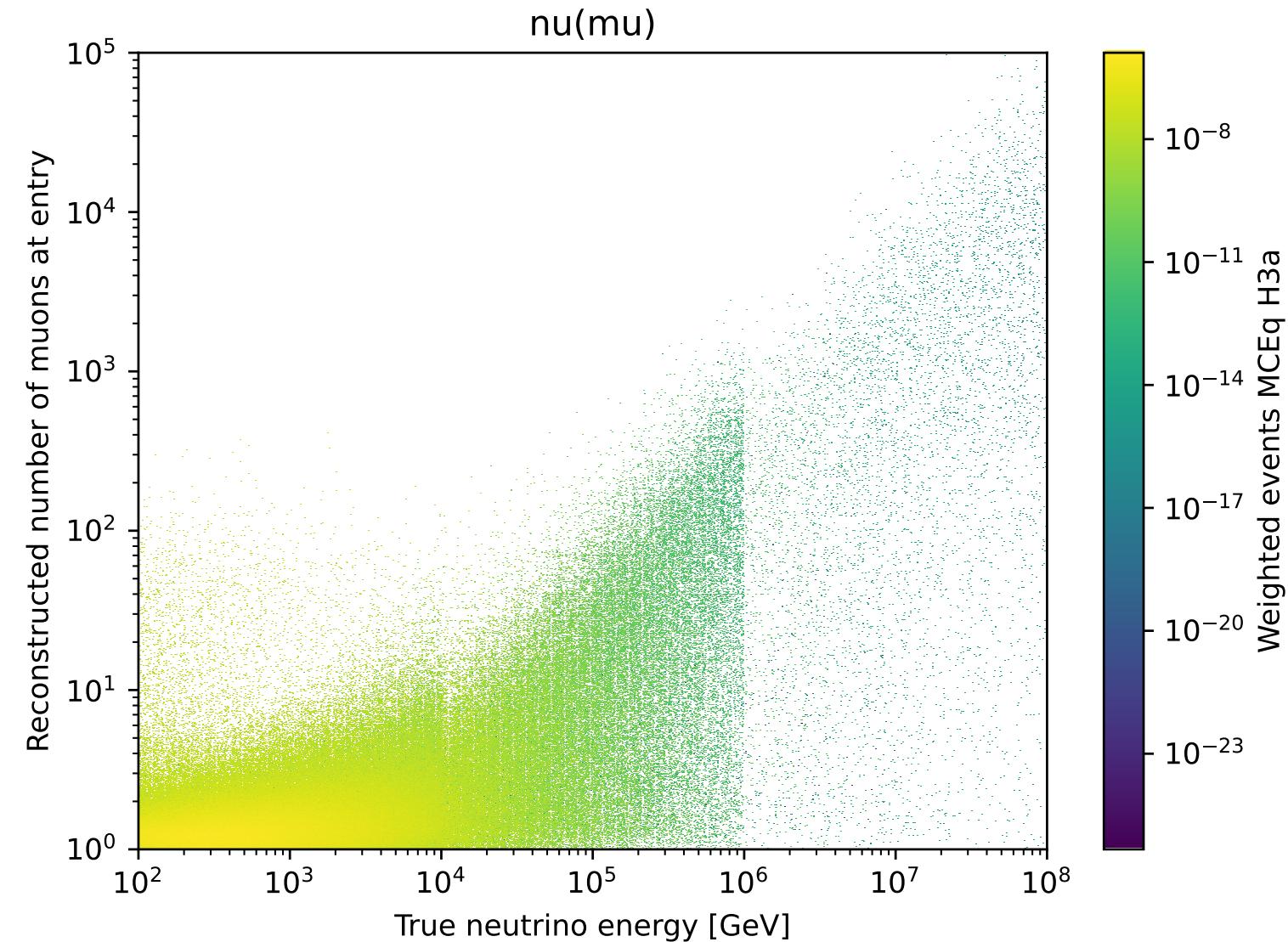
All neutrino types



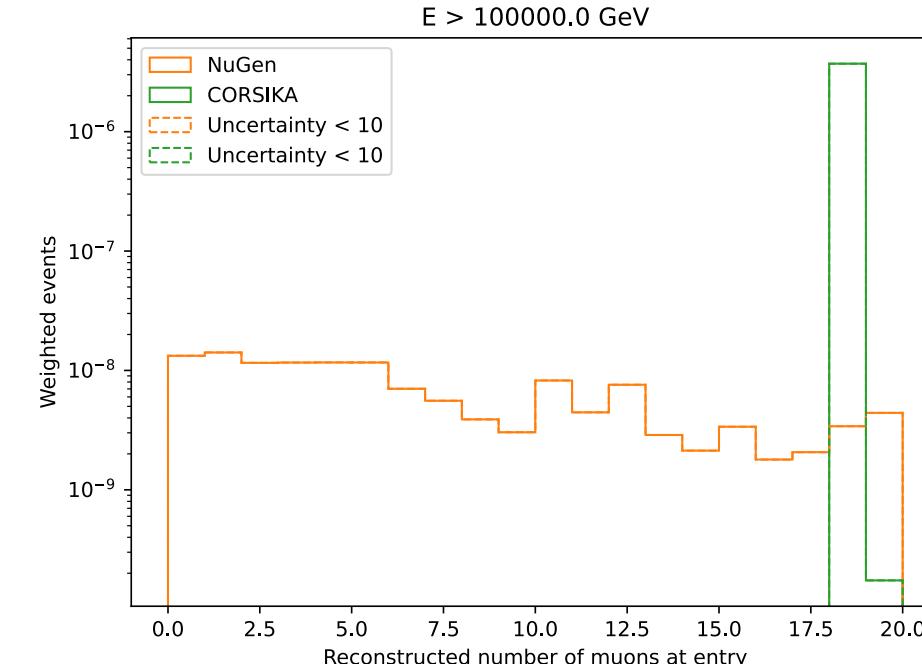
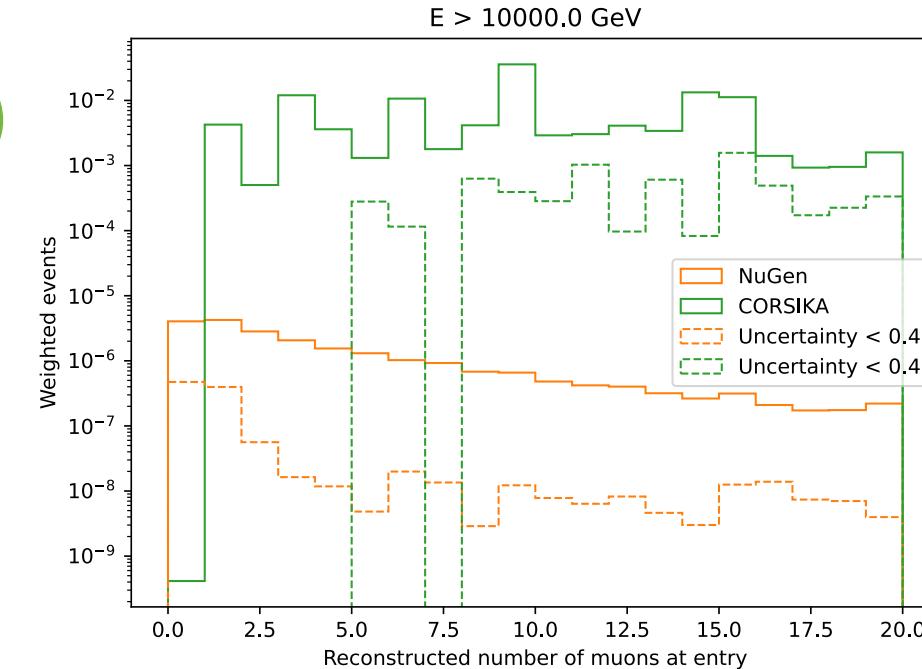
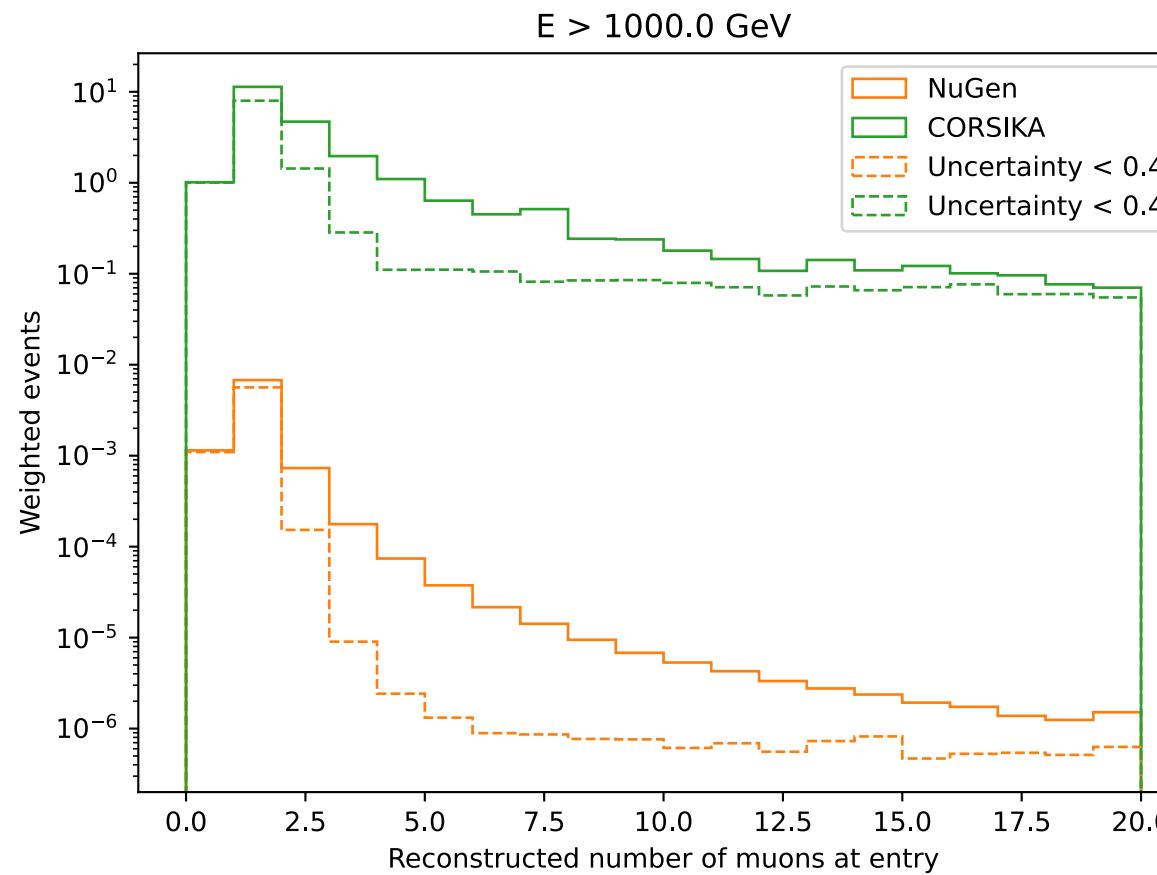
Different flavors



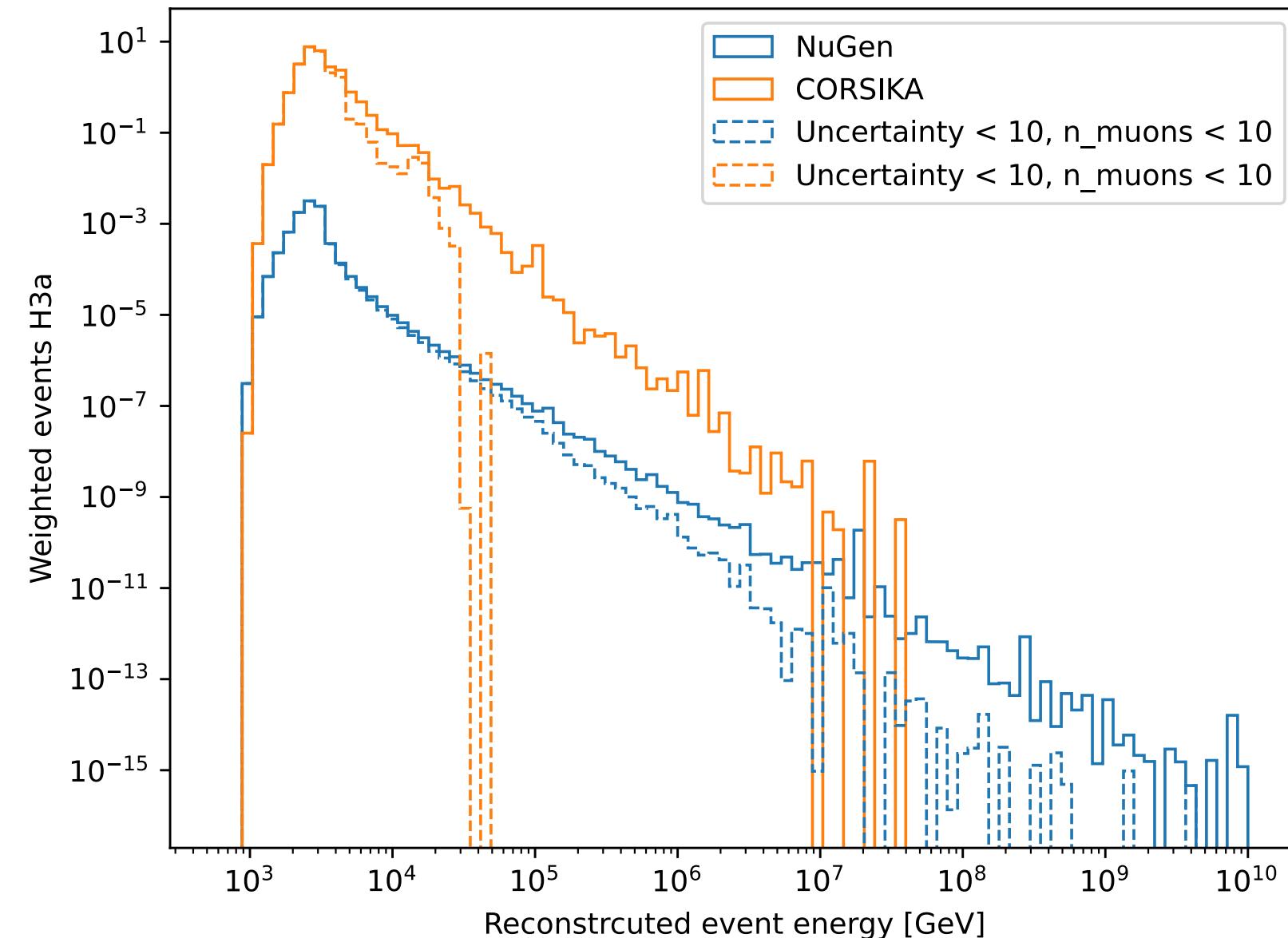
Multiplicity – energy correlation



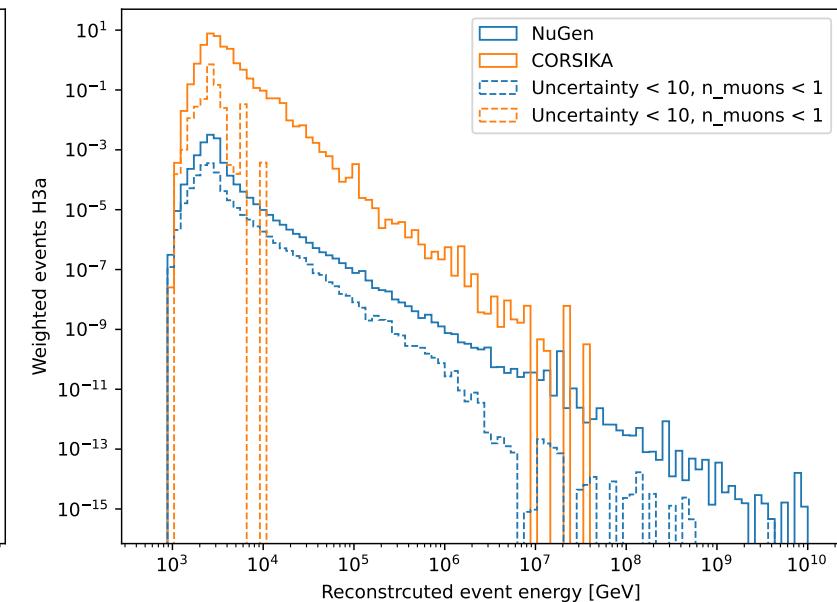
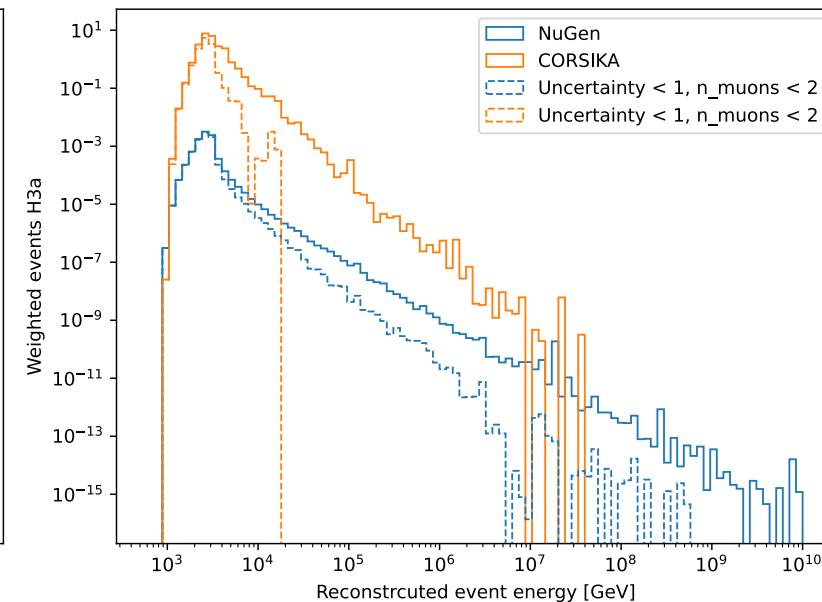
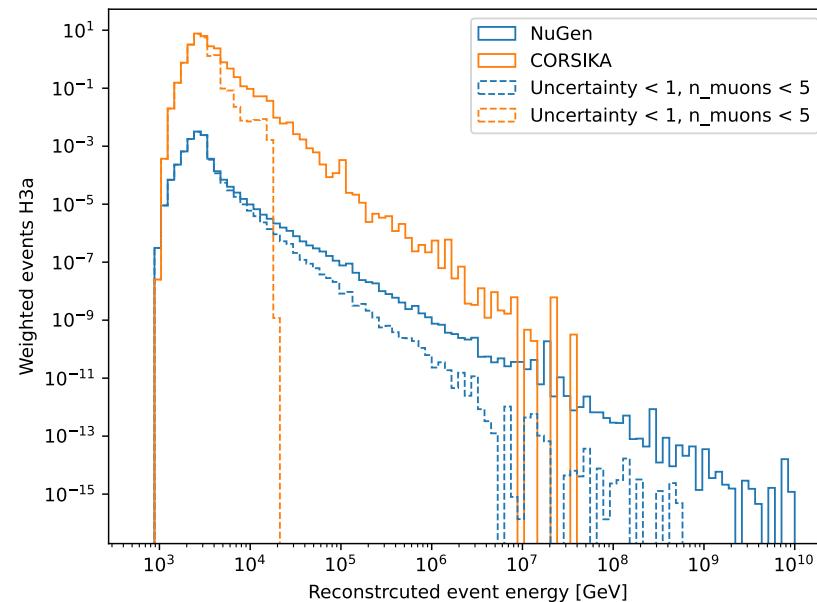
Uncertainty cuts (energy dependent)



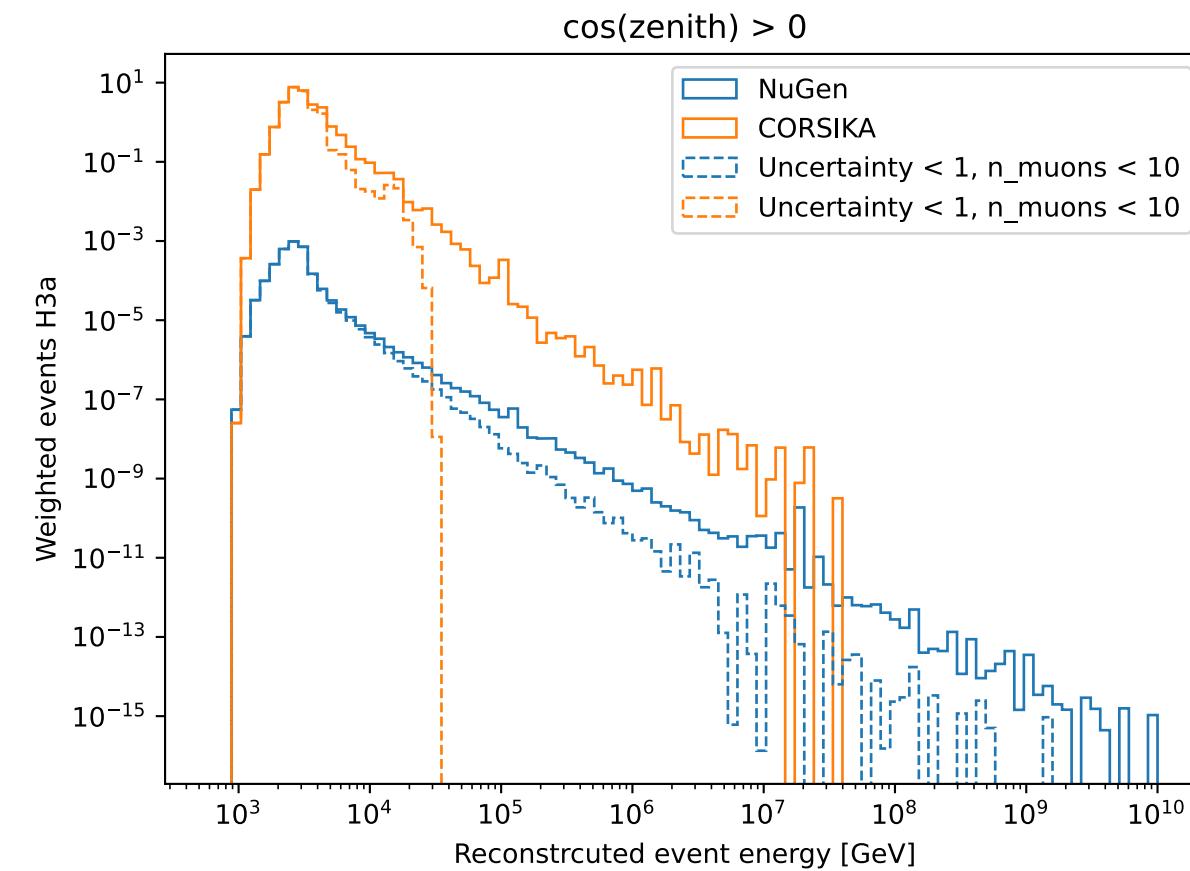
Selection



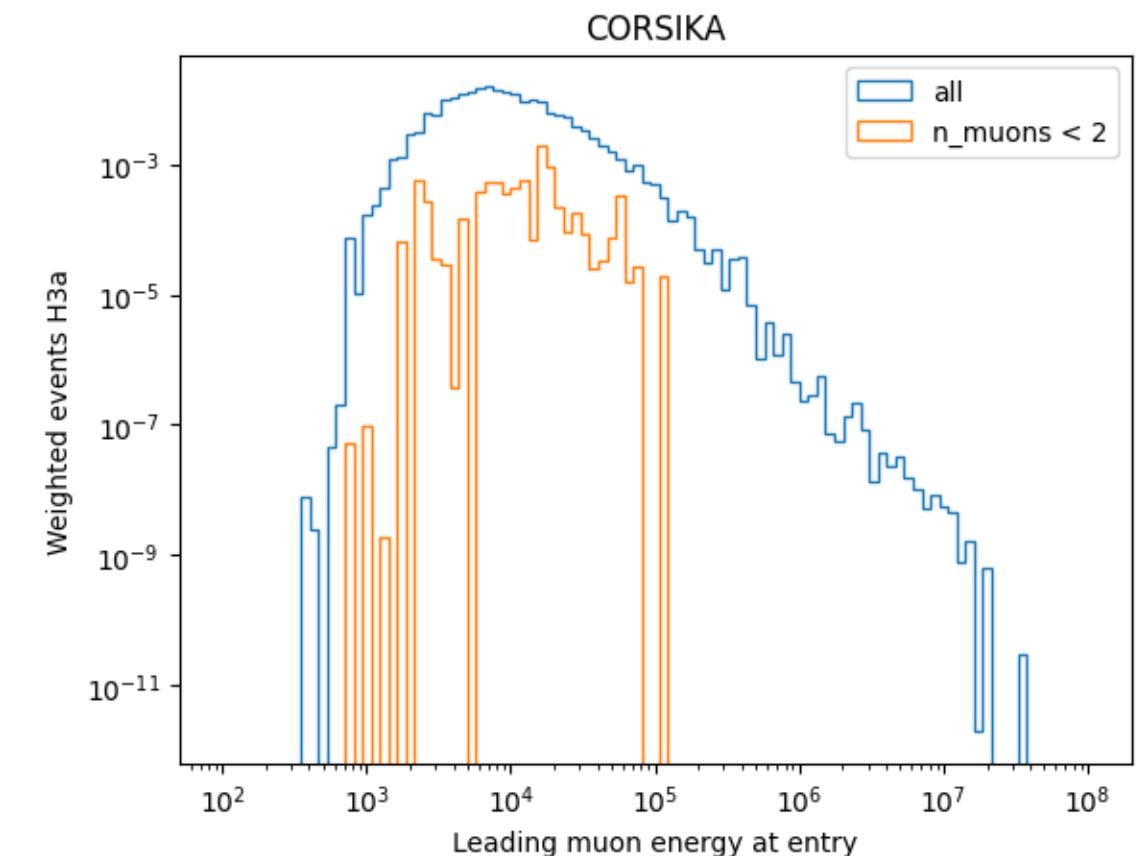
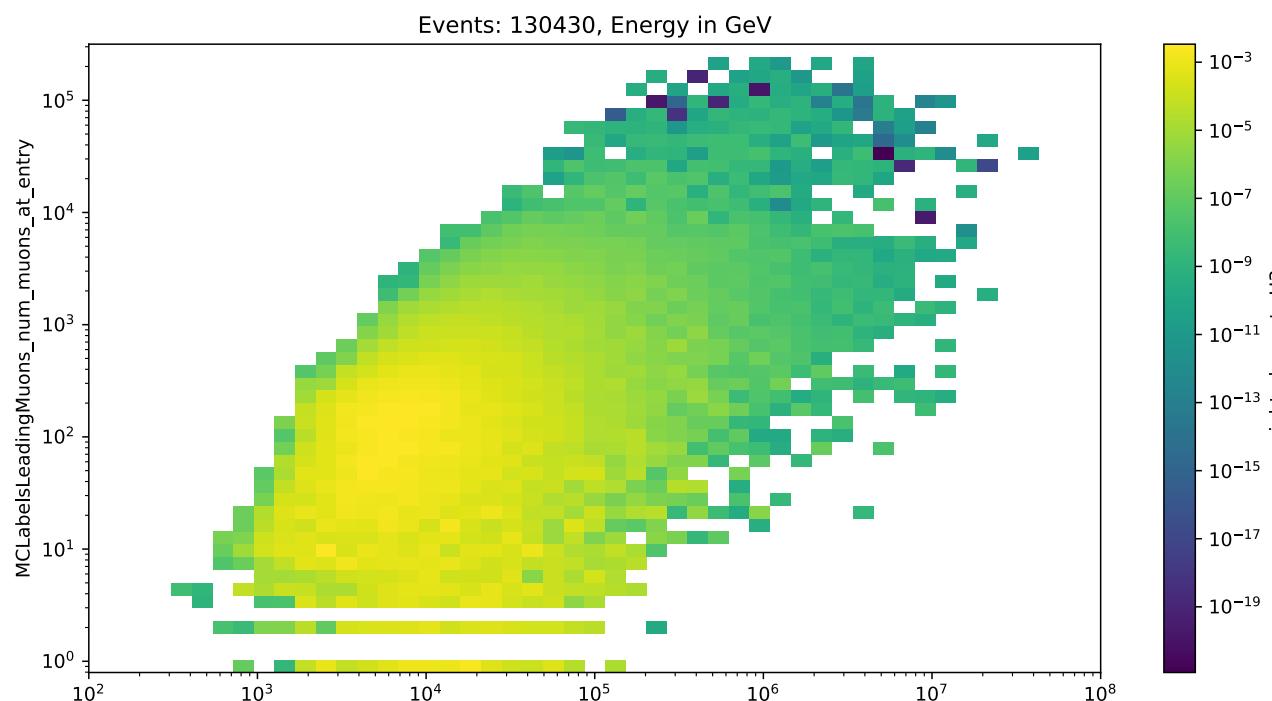
Different cuts (uncertainty, number of muons)



Down-going events only

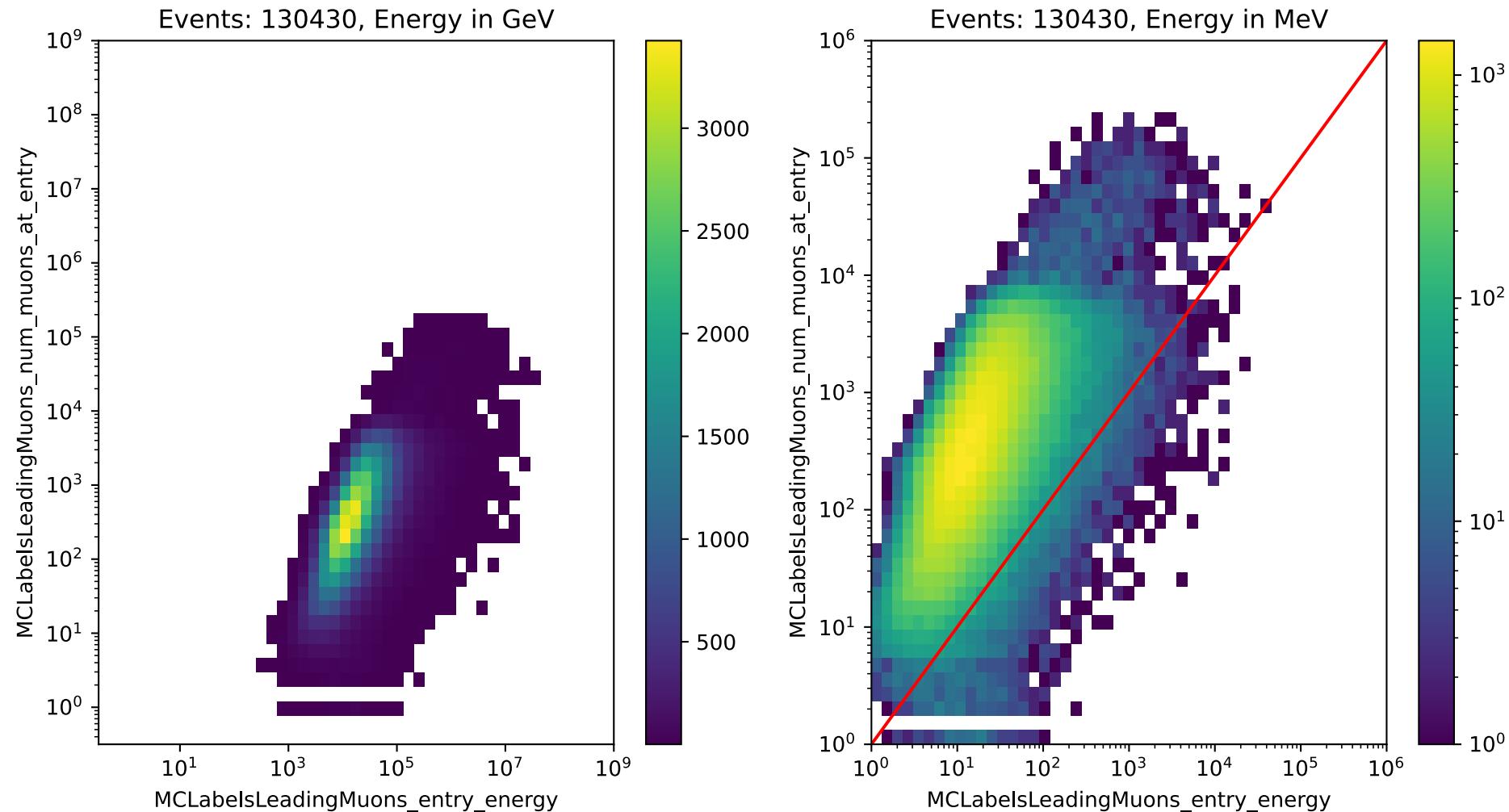


Theoretical limits

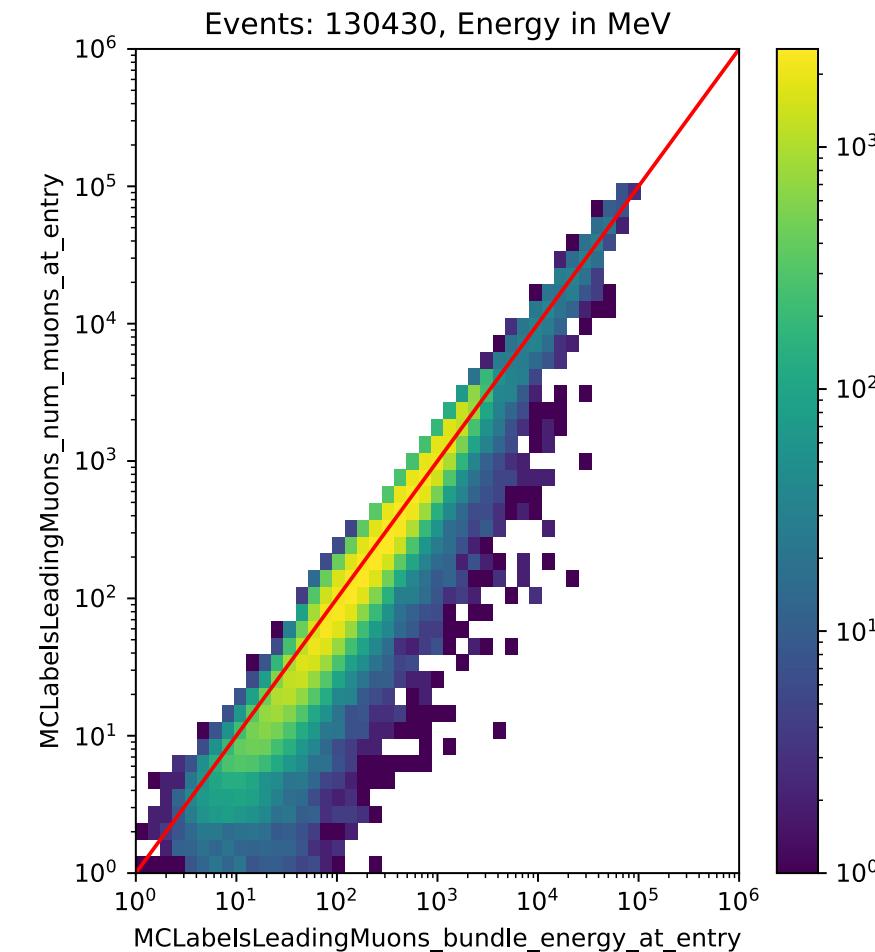
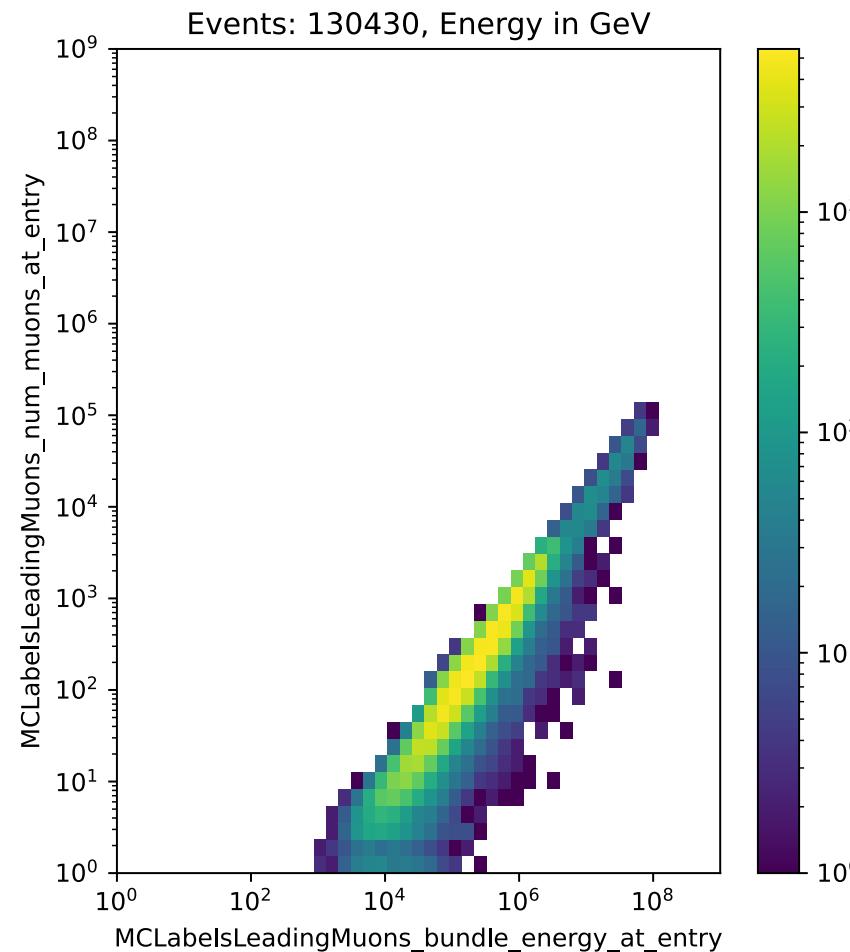


No single muons induced by an airshower above ~ 150 Tev

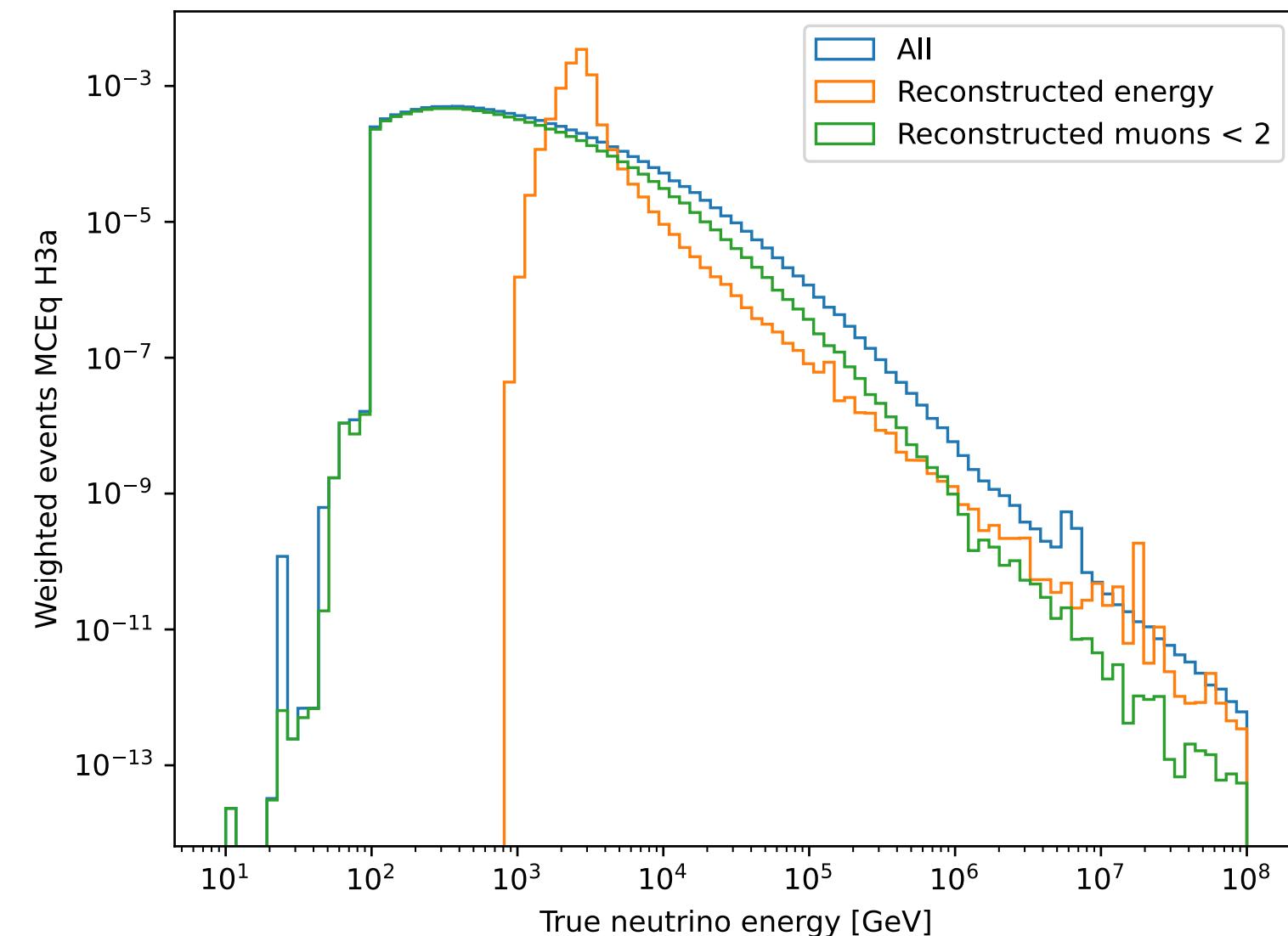
Correlation: number muons vs leading energy



Correlation: number of muons vs bundle energy



Energy reconstruction

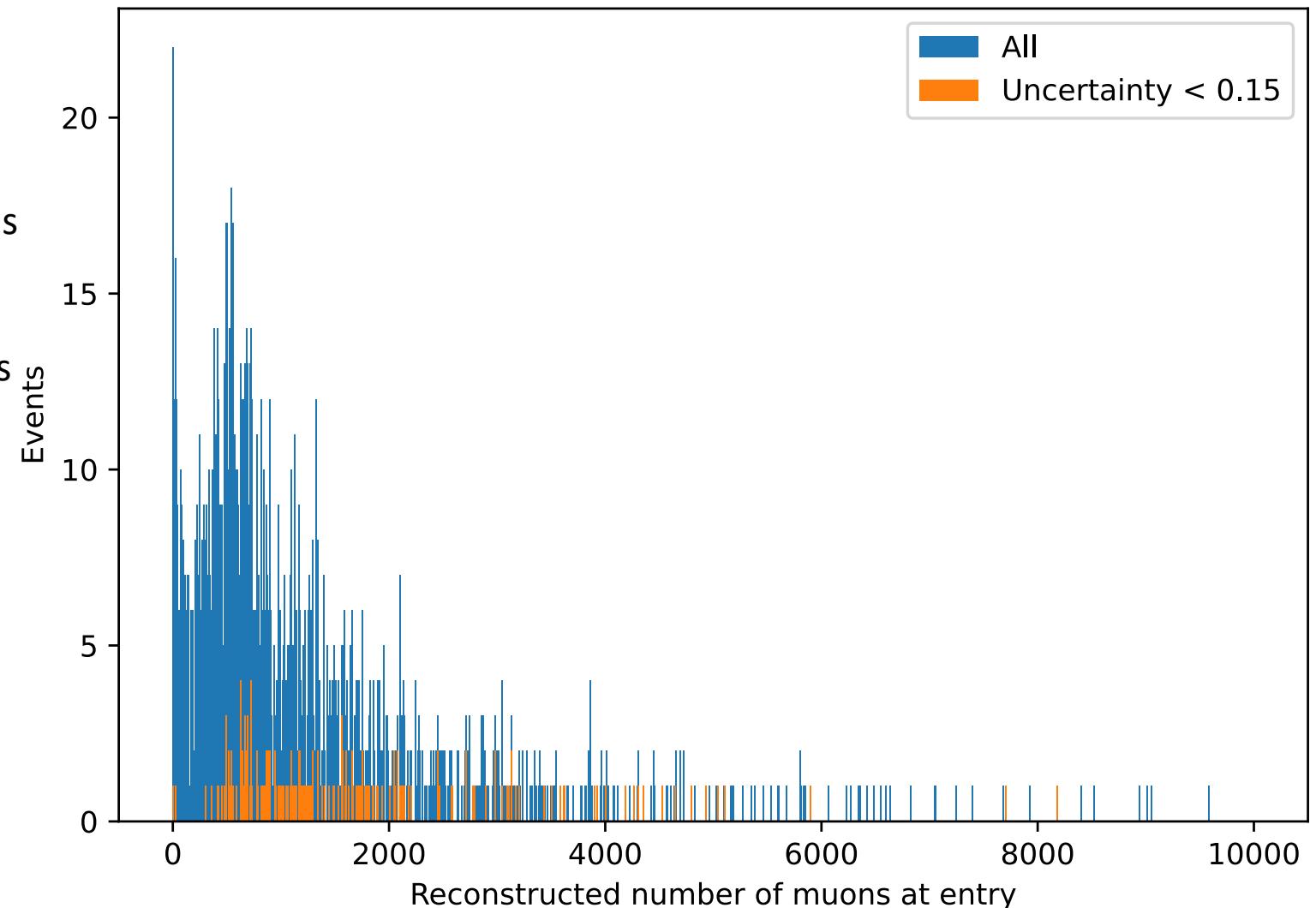


GFU reconstruction

A lot of caveats...

- SplitInIceDSTPulses not available
- Network trained on down-going muons only
- Has never seen a neutrino
- Tries to estimate the number of muons at detector entry

GFU



Conclusion

- test network to reconstruct muon multiplicity
- energy reconstruction trained on leading muon energy
- everything is preliminary
- overall, the selection seems to work
- GFU reconstruction does not work so far

To my muons:

- a lot of software issues (installation and also new iceprod simulation, filters don't work,...)
- preparing training data for some muon reconstructions (for precut)
- preparing training data for neutrino energy reconstruction (for Basia)
- new master student in Dortmund – prompt neutrinos