ZHH Status

Lepton ID and ParticleNet Flavor Tagging

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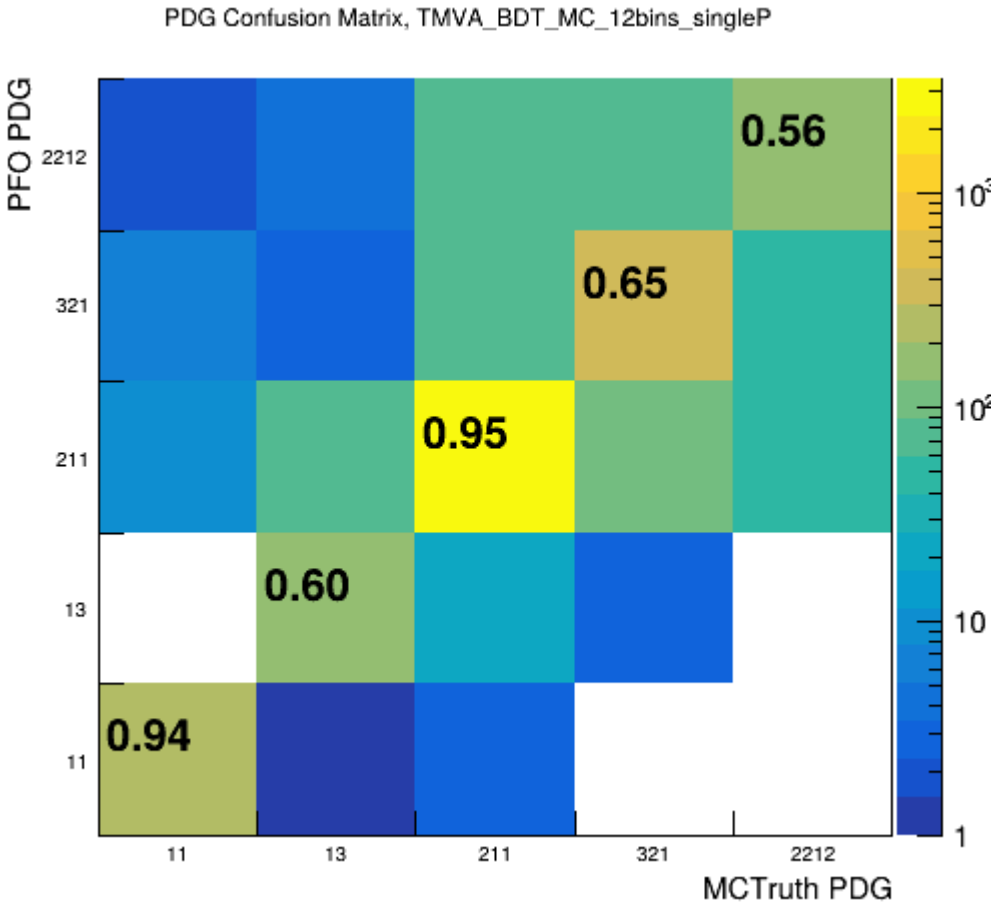
CPID Training

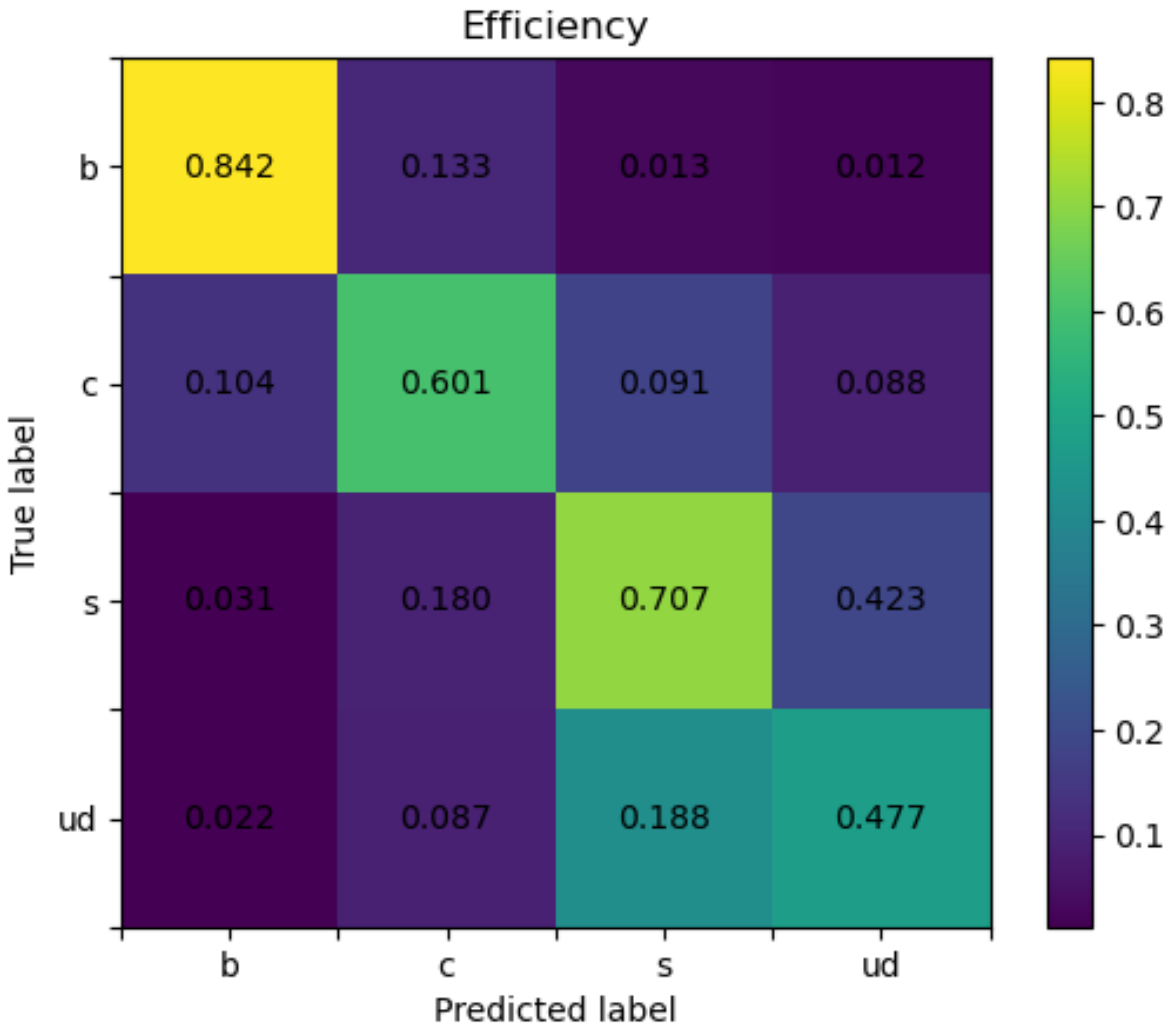
- Problem:
  - Model files sofar only for 250 GeV production there: newer TOF implementation
  - Rerunning TOF requires REC files
- Now: retrain CPID without TOF
  - Training on `4f_WW_semileptonic`
- Next steps:
  - Validation and comparison with Pandora PFO type
  - Analysis of muon CPID, especially at higher momenta

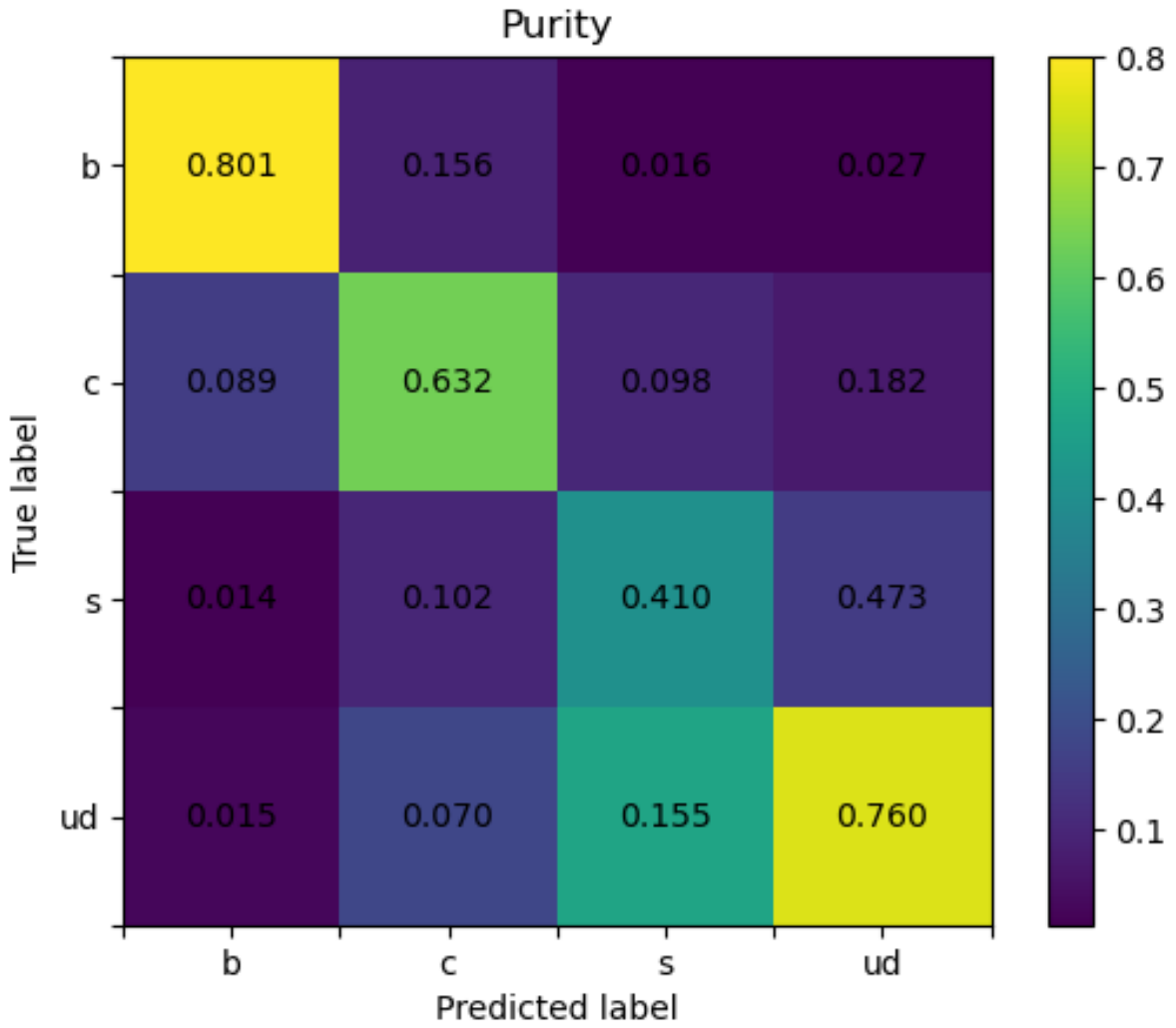


ParticleNet

- Much bug hunting in cooperation with Ulrich Einhaus and Thomas Madlener
- Training reimplemented:
  - Using PyTorch DataLoaders and Dataset classes, with correct batch size
  - Dataset size ca. halfed (by using correct data types)
- Training so far without CPID (retraining underway)
- Some bugs found between Python and Marlin/C++ implementation
  - Normalization of inputs subtly different, handling of missing/NaN values

ParticleNet b Tagging in Python



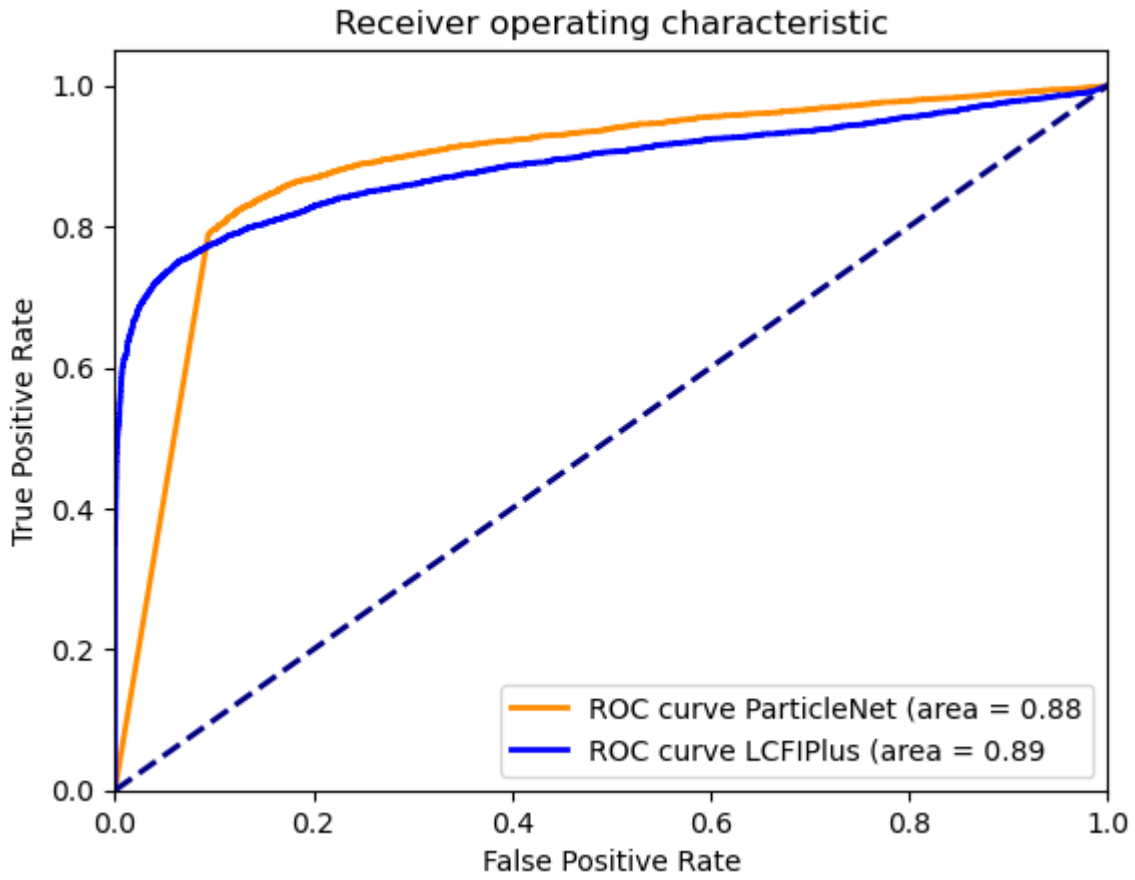


ParticleNet b Tagging in Marlin

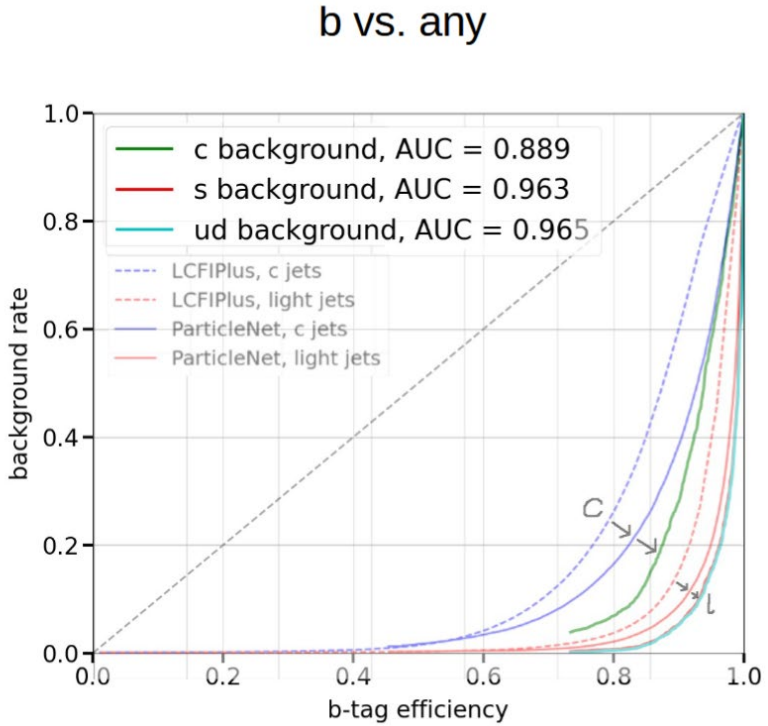
	bbbbbb data	ccccccc data
ParticleNet	Entries 5970 Mean 0.8557 Std Dev 0.3415 Underflow 0 Overflow 0	Entries 5970 Mean 0.1734 Std Dev 0.3616 Underflow 0 Overflow 0
LCFIPlus	Entries 5970 Mean 0.7176 Std Dev 0.3604 Underflow 0 Overflow 0	Entries 5970 Mean 0.1286 Std Dev 0.1617 Underflow 0 Overflow 0

B Tag Output

ParticleNet b vs c Tagging in Marlin



ROC Curves - Comparison



U. Einhaus