Update in CyberPFA

Fangyi Guo

中国科学院高能物理研究所
Institute of High Energy Physics, Chinese Academy of Sciences

Update in CyberPFA

- **A new MR !153 in CEPCSW: harmonize with standalone analysis.**
  - ECAL and HCAL digitization: add some effects from electroncs.
    - Energy resolution may go worse.
  - Tracking: improve the precision in G4 simulation [MR !159 by Zhihao Li and Chengdong Fu]
    - Track momentum bias is fixed.
  - PFA:
    - Add a BDT-based track cleaning.
    - Add separate scale constant for charged/neutral ECAL and HCAL constant.

```
+ CyberPFAlg.TrackIDFile = "/cvmfs/cepcsw.ihep.ac.cn/prototype/releases/data/latest/CEPCSWData/offline-data/Reconstruction/CyberPFA_trackID/TrkID_BDT_BDTG.weights.xml"
+ CyberPFAlg.TrackIDMethod = "BDTG"
+ CyberPFAlg.EcalChargedCalib = 1.26
+ CyberPFAlg.HcalChargedCalib = 4.0
+ CyberPFAlg.EcalNeutralCalib = 1.0
+ CyberPFAlg.HcalNeutralCalib = 4.0
```

BDT weight file might not in /cvmfs/ yet, can be found in /afs/ihep.ac.cn/users/g/guofy/TrkID_BDT_BDTG.weights.xml

  - Jet clustering in GenMatch:
    - add a branch: barrelRatio = $N_{MC}^{|\cos\theta|<0.85} / N_{MC}^{all}$.
  - A set of scripts in Reconstruction/RecPFACyber/script/
  - *Detailed performance will be updated this week.*

Update in CyberPFA

- **BMR in new MR**
  - Different criteria in standalone and CEPCSW:
    - in standalone: barrelRatio > 95%, $m_{jj} = 124.3 \pm 4.8$ GeV, BMR = 3.83%±0.05%
    - in GenMatch for physics analysis: $|\cos\theta_j| < 0.7$, $m_{jj} = 123.7 \pm 4.9$ GeV, BMR = 4.00%±0.05%
    - in CDR with Arbor: ISR pT < 1 GeV, neutrino pT < 1 GeV. BMR ~ 3.7%.
    - A script: Reconstruction/RecPFACyber/script/roofit_jets.cpp.