

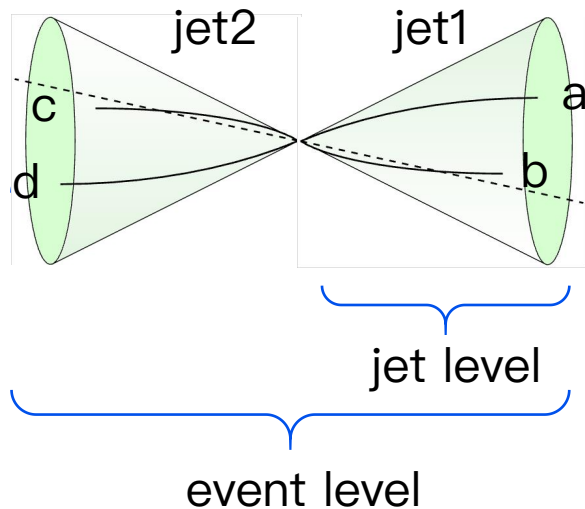


# Flavor–tagging using BDT

2025 0324

# Vertex splitting

- event level VS jet level
- problem: mismatch in granularity
  - When performing jet-level classification, we are using partially event-level features
- solve: vertex splitting



before:

jet1: [a,b,c,d]  
jet2: [a,b,c,d]

after:

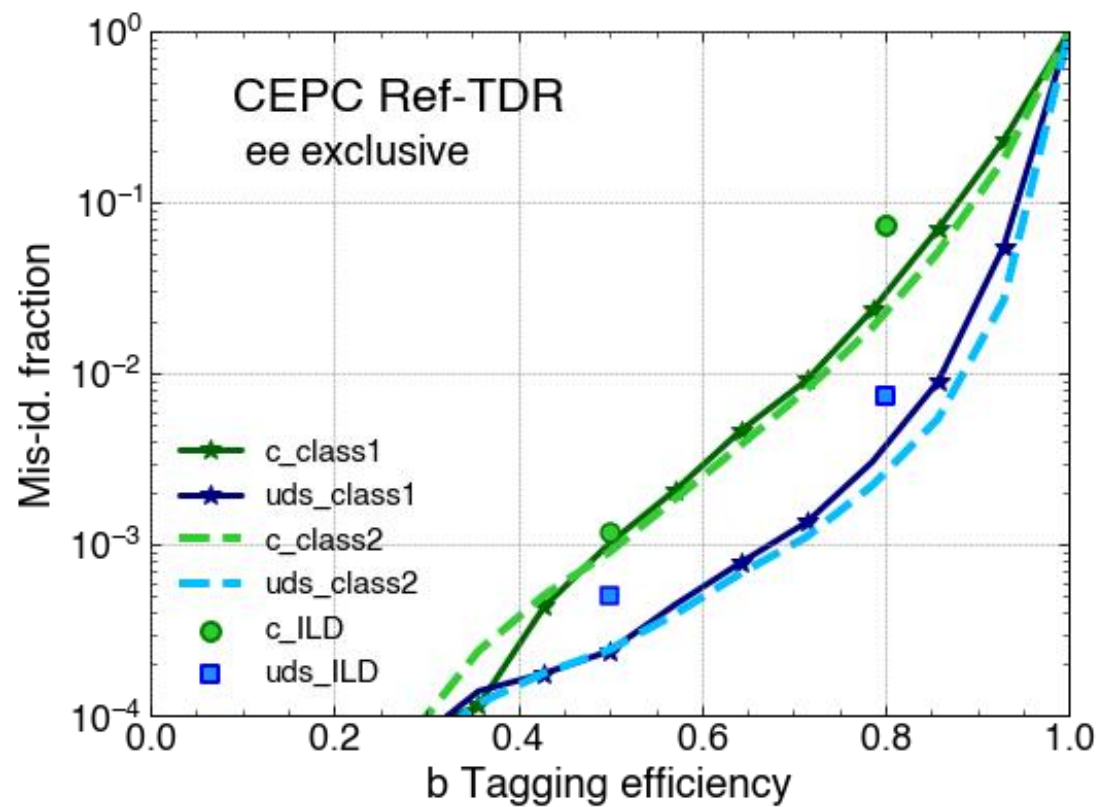
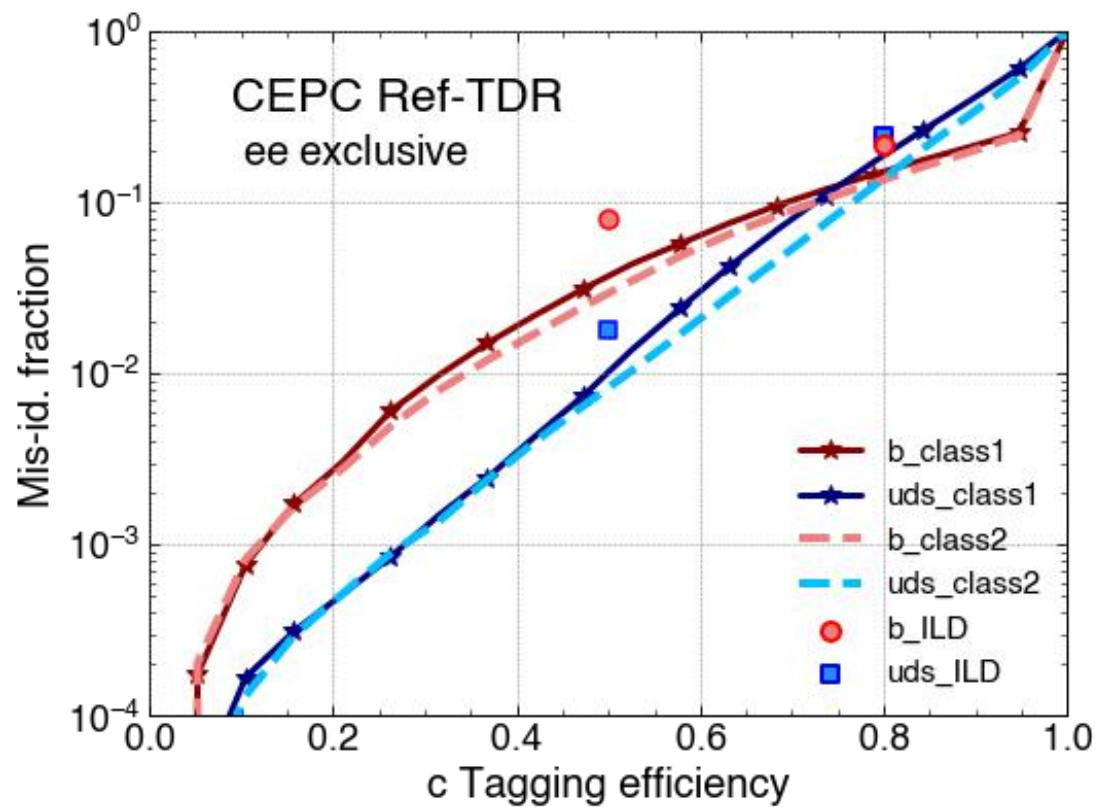
jet1: [a,b]  
jet2: [c,d]

## Features for BDT

```
class1= ["SingleVtxProb", "JetVtxLxyz_0", "JetVtxLxyz_1", "vtxlen12","JetVtxAngle_0",  
"JetVtxAngle_1", "vtxsig_0", "vtxsig_1","vtxsig12", "vtxmult", "Njetvtxtrk_0", "Njetvtxtrk_1",  
"JetVtxMomenta_0", "JetVtxMomenta_1" ,"JetVtxMass_0", "JetVtxMass_1", "trk1d0sig",  
"trk2d0sig", "trk1z0sig", "trk2z0sig", "trk1pt", "trk2pt", "JetTotalVtxMass","allTrackD0bprob",  
"allTrackD0cprob", "allTrackD0qprob", "allTrackZ0bprob", "allTrackZ0cprob",  
"allTrackZ0qprob",'JetVtxProbablity_0','JetVtxProbablity_1', 'allTrackMass'] # 32
```

```
class2 = [  
    'Njettrk', 'Njetvtx', "JetVtxCollinearity_0", "JetVtxCollinearity_1", "JetVtxChi2_0",  
"JetVtxChi2_1", "JetVtxEnergy_0", "JetVtxEnergy_1", "JetVtxKin_0",  
"JetVtxKin_1","JetEnergy","allTrackD0_0", "allTrackD0_1", "allTrackZ0_0", "allTrackZ0_1" +  
class1] # 47
```

# Performance



# Performance

