

```
eta = self.fChain.CaloTowerSp4[itow].eta()
energy = self.fChain.CaloTowerSp4[itow].energy()
if (abs(eta)>2.9 and abs(eta)<-5.2) :
    if (eta>0) :
        hfg_tow_energy_tot += energy
        hfg_tow_energy_max = max(hfg_tow_energy_max, energy)
        self.hist["hfg_tow_tower"].Fill(energy)
    else :
        hfm_tow_energy_tot += energy
        hfm_tow_energy_max = max(hfm_tow_energy_max, energy)
        self.hist["hfm_tow_tower"].Fill(energy)

#####calo jets#####Castor Calo jets#####
#####
jet_particles_list_calo = []
for itow in range(self.fChain.CaloTowerSp4.size()):
    # for itow_castor in range(self.fChain.CastorTowerSp4.size()):
    # jet_particles_list_calo.append(self.fChain.CastorTowerSp4[itow_castor])
    eta = abs(self.fChain.CaloTowerSp4[itow].eta())
    if (eta>4.25) :
        self.hist["calo_mult"].Fill(self.fChain.CaloTowerSp4.size())
        self.hist["calo_pt"].Fill(self.fChain.CaloTowerSp4[itow].pt())
        self.hist["calo_eta"].Fill(self.fChain.CaloTowerSp4[itow].eta())
        self.hist["calo_phi"].Fill(self.fChain.CaloTowerSp4[itow].phi())
        self.hist["calo_j_energy"].Fill(self.fChain.CaloTowerSp4[itow].energy())
        print ("pt = ", self.fChain.CaloTowerSp4[itow].pt())

jet_particles_list_calo = []
for itow_castor in range(self.fChain.CastorTowerSp4.size()):
    jet_particles_list_calo.append(self.fChain.CastorTowerSp4[itow_castor])
    eta = abs(self.fChain.CastorTowerSp4[itow_castor].eta())
    if (eta>4.25) :
        self.hist["castor_mult"].Fill(self.fChain.CastorTowerSp4.size())
        self.hist["castor_calo_pt"].Fill(self.fChain.CastorTowerSp4[itow_castor].pt())
        self.hist["castor_calo_eta"].Fill(self.fChain.CastorTowerSp4[itow_castor].eta())
        self.hist["castor_calo_phi"].Fill(self.fChain.CastorTowerSp4[itow_castor].phi())
        self.hist["castor_calo_j_energy"].Fill(self.fChain.CastorTowerSp4[itow_castor].energy())

#####Gen particles#####
#####
jet_particles_list_gen = []
for iPart in range(self.fChain.genParticlesSp4.size()):
    jet_particles_list_gen.append(self.fChain.genParticlesSp4[iPart])
    eta = self.fChain.genParticlesSp4[iPart].eta()
    if (abs(eta)>4.25) :
        if (self.fChain.genParticlesSp4[iPart].eta()>-6.5 and self.fChain.genParticlesSp4[iPart].eta()<-5.2) :
            self.hist["eta"].Fill(eta)
            self.hist["energy"].Fill(self.fChain.genParticlesSp4[iPart].energy())

-:~% MinimumBias.py 32% L118 (Python ElDoc)
```

Uncomment code block, you need this

remove this line since it deletes jet_partilce_list_calo

```
#
# for jet in jets_calo:
#     if (jet.eta > -6.6 and jet.eta < -5.2):
#         if (eta>4.25):
#             self.hist["calo_mult"].Fill(mult_calo)
#             print("calo_j_pt = ", jet_calo.pt)
#             self.hist["calo_j_energy"].Fill(jet.e)
#             self.hist["calo_j_eta"].Fill(jet.e)
#             self.hist["calo_j_pt"].Fill(jet.pt)
#             self.hist["calo_j_phi"].Fill(jet.phi)

jet_particles_list_calo = []
jet_particles_calo = np.array([(p.energy(), p.Px(), p.Py(), p.Pz()) for p in jet_particles_list_calo], dtype = [('E', 'f8'), ('px', 'f8'), ('py', 'f8'), ('pz', 'f8')])
sequence_calo = cluster(jet_particles_calo, R=0.4, ps=1)
jets_calo = sequence_calo.inclusive_jets()
mult_calo = len(jets_calo)
print("gen_j_Mults = ", mult_calo)
for jet in jets_calo:
    if (abs(jet.eta) > 4.25):
        if (jet.eta > -6.6 and jet.eta < -5.2):
            self.hist["calo_mult"].Fill(mult_calo)
            #print("calo_j_eta = ", jet.eta)
            self.hist["calo_j_energy"].Fill(jet.e)
            self.hist["calo_j_eta"].Fill(jet.e)
            self.hist["calo_j_pt"].Fill(jet.pt)
            self.hist["calo_j_phi"].Fill(jet.phi)

##### Calo Gen Jet Matching hist #####
#####
matched = []
pileup = []
background = []
missing = []

threshold = 1
jet_particles_list_calo = []
jet_particles_calo = np.array([(p.energy(), p.Px(), p.Py(), p.Pz()) for p in jet_particles_list_calo], dtype = [('E', 'f8'), ('px', 'f8'), ('py', 'f8'), ('pz', 'f8')])
sequence_calo = cluster(jet_particles_calo, R=0.4, ps=1)
jets_calo = sequence_calo.inclusive_jets()
matched_calo_j_phis = " ".join(jets_calo)
gen_assigned = []

for calo_jet in jets_calo:
    if calo_jet.pt<threshold:
        continue
    jet_match = 1
    print ("calo_jet.eta")
    print (calo_jet.eta)

    for gen_jet in jets_gen:
        if gen_jet.pt<threshold:
            continue
        if gen_jet in gen_assigned:
            continue
```

Note: look, here you cluster jets from, both, calo towers with eta>4.25 and CASTOR towers --> great!

This has to be removed, it is a 100% copy of this --> already done

```
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emacs@lucktop <2>
jsets_calco = sequence_calco.inclusive_jsets()
# print("calco_j_Multi = ", len(jsets_calco))
gen_assigned = []

for calo_jet in jsets_calco:
    if calo_jet.pt<threshold:
        continue
    jet_match = []
    print("calo_jet.eta")
    print(calo_jet.eta)

    for gen_jet in jsets_gen:
        if gen_jet.pt<threshold:
            continue
        if gen_jet in gen_assigned:
            continue
        self.hist["jet_matching_pt"].Fill(gen_jet.pt, calo_jet.pt)

        delta_Eta = gen_jet.eta - calo_jet.eta
        delta_Phi = gen_jet.phi - calo_jet.phi
        delta_R = sqrt(delta_R*delta_R + delta_Phi*delta_Phi)

        if (delta_R<0.4):
            jet_match.append(gen_jet)
            gen_assigned.append(gen_jet)
            print("jet_match ")
            print(jet_match)

    if (len(jet_match)==0):
        background.append(calo_jet)
        print("background ")
        print(background)
    jet_match.sort(key=lambda jet : jet.pt, reverse=True)
    matched.append( (calo_jet, jet_match[0]) )
    for ijset in range(1, len(jet_match)):
        pileup.append( (calo_jet, jet_match[ijset]) )
        print("pileup ")
        print(pileup)

    for gen_jet in jsets_gen:
        if gen_jet.pt<threshold:
            continue
        if gen_jet in gen_assigned:
            continue
        missing.append(gen_jet)
        self.hist["jet_matching_pt"].Fill(gen_jet.pt, calo_jet.pt)

print("***** jet summary *****")
print(" calo-jets ")
print(jsets_calco)
print(" gen-jets ")
print(jsets_gen)
print(" matched jets ")
print(matched)
print(" pileup ")
print(pileup)
```

add "continue" statement in this "if block".
The code should jump to the next gen_jet, if there was no match.
(If you don't do this, there should be crashes!)