SUMMARY AND WRAP UP OF MARTINO'S QT

COLLECTING RESULTS -1

- from >1 year of work

  - TOPIC: study impact of track-jet association on b-tagging performance

- plan agreed with conveners, based on analysis capability already developed and shown / reported over the year:

  - here

  - 3 sets of results for 3 variants of b-tagging setting

    - b-tagging settings:

      - A) b-tagging applied to EMPFlow jets (particle flow based jets, default for physics)

        - track association is cone based, come size is a function of jet pt (optimized years ago)

      - B1) b-tagging applied to VR30Rmax4Rmin02TrackJets (variable radius track jets, default for physics)

        - track association is cone based, come size is a function of jet pt (optimized years ago)

      - B2) b-tagging applied to AntiKtVR30Rmax4Rmin02TrackGhostTagJets (experimental)

        - same algorithm/inputs for jet reconstruction as B1 but track associated with the ghost criterion, i.e. with the same procedure used to associate four momenta into AntiKt jets

COLLECTING RESULTS -2

- **3 sets of results - all MC based (like all algorithm studies !)**
  - *A: b-jet features vs jet labeling*
    - INTRO: b-tagging performance measurement are based on empirical (truth) definitions of b/c-jets;
    - a b/c jet is a jet such that a B-hadron (generic hadron with a b quark) in the list of MC true particles of the event, with pT>5GeV is *associated* to the jet
      - *associated*:
        - cone based (DR < 0.3 between truth hadron w.r.t. reco-jet axis)
        - ghost based (for Akt04)
      - categories:
        - jets with 1 B hadron (b-jets),
        - jets with 1 D hadron and 0 B hadrons (c-jets)
        - jets with 0 B and 0 C hadrons (light jets)
        - jets with 2 or more B hadrons (2b-jets) - in practice light jets (gluon splitting to bb)
        - jets with 2 or more C hadrons (2c-jets) - in practice light jets (gluon splitting to cc)
        - jets with 1 D hadron and 2 B hadrons (1c2b-jets) - in practice c-jets + g->bb
    - GOAL: categorize jets based on the coeherence / difference of labels they get according to the two criteria
      - build a 6x6 matrix and study jet, B/C hadron features in ~each 36 categories

Collecting Results -3

- **3 sets of results - all MC based (like all algorithm studies !)**
  - *B: b-tagging efficiency*

COLLECTING RESULTS -3

- **3 sets of results - all MC based (like all algorithm studies !)**

  - *C: track association efficiency*

    - INTRO: tracks associated to jets are assigned an *origin* according to MC truth of hits contributing to the track

      - *origin* b-hadron, c-hadron, fake (now well reconstructed) b-hadron, fake c-hadron, fragmentation, pileup, fake

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