Strategy and samples for flavour tag training

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Remarks from pre-discussions

From the view point of developments (Taikan),

- 1 M jets for each flavours (Same as DBD era)

- Some RECO data would be useful for debugging / future developments

From the view point of computing resources (Akiya),

- Storage size matters (while CPU time does not)

- DST allows us to have 4 different configuration even for 1 M jets for each flavours.

Previous flavour tag performance showed small dependency on jet energies (especially higher than 20 GeV)

Why so?

- Only vertical components of trajectories to jet direction contributes to vertex point resolution

- A trick in LCFIPlus : Energy dependent variables (Decay length, track pt etc) are normalized by jet energy before feeding into MVA training to make them energy independent

Why not perfectly?

- Multiple scattering introduces energy dependency, especially at low energies.

- Strictly speaking, acceptance cuts and detector effects also does not guarantee jet energy invariance.

—> To gain the best performance (though the difference is small), training with proper jet energies helps.
Also may be interesting to study more deeply energy dependency on flavour tagging.

—> Both 91GeV- and 250GeV- 2 jet samples would be useful.

Summary of our requests

Common requirements for samples

- w/ crossing angle
- left (or right) polarized beam pol. configuration (One setting will do)

① ν ν bb/ν ν cc/ν ν ss/ν ν gg/ν ν uu/ν ν dd (via ZH) at 250 GeV

     500 k events for each mode (DST + 10k Reco for debugging/development)

     ISR on

     w/ beam background (can be removed by MC info if necessary)

② **bb/cc/ss/uu/dd at 91 GeV**

     500 k events for each mode (DST + 10k Reco for debugging/development)

     ISR off (back-to-back events)

     w/o beam background (no beam parameters)

③ **bb/cc/ss/uu/dd at 250 GeV**

     500 k events for each mode (DST + 10k Reco for debugging/development)

     ISR off (radiative return off)

     w/ beam background

④ **4b/4c/4s/4u/4d at 250 GeV**

     250 k events for each mode (DST + 5k Reco for debugging/development)

     ISR on

     w/ beam background