Weekly report

FANGYI GUO

CEPC workshop plan

Photon resolution(by Manqi):
- $\frac{\sigma}{E} = \frac{a}{\sqrt{E}} \oplus b$, smear truth photon with a from 0~20%, see $\delta\mu$
- qqyy channel, focus on qq recoil mass.

360GeV:
- Full simulation sample has been generated, need to confirm.

MVA in all 3 sub-channel:
- Plan to update to full simulation. FSClasser has no problem, only need to use correct processor.

ATLAS QT

Implement and test a new e→γ fake rate tool (Urgent)

- *Description*: e→γ fake rate scale factors have been measured centrally using Z→ee events. A tool, perhaps based on existing tools, must be adapted to read in these scale factors and apply them to an analysis. Ideal for students working simultaneously on low-p_T diphoton analyses.
- *Deadline*: ASAP, can begin immediately

Develop cut-based suppression of electrons

- *Description*: Using an unbiased sample of electrons, develop new shower shape variables to improve the separation between photons and electrons. Ideal for students working simultaneously on low-p_T diphoton analyses, as variables targeting separation with electrons can reduce the impact of the dielectron Z-peak.
- *Deadline*: ASAP, can begin immediately

Re-optimize loose and medium photon ID menus

- *Description*: possibly using an existing tool, re-optimize cuts-based loose and medium photon ID selections to improve a measurement sensitivity of certain physics analyses. This can be done using single photons and/or radiative-Z samples.
- *Deadline*: can begin immediately

Develop new shower-shape variables (additional people welcome)

- *Description*: develop new shower shape variables to improve the separation between photons and jets (the primary photon background), or converted photons and unconverted photons. New variables can improve a cut-based or MVA identification.
- *Deadline*: can begin immediately

Photon ID efficiency dependence on N_{jet} and pileup (additional people welcome)

- *Description*: study the photon ID efficiency dependence on $<\mu>$, the number of jets N_{jet}, as a function of the cut on $\Delta R(\gamma, jet)$, etc. Develop the methodology to mitigate the dependency on the pileup. This task is particularly important for HL-LHC.