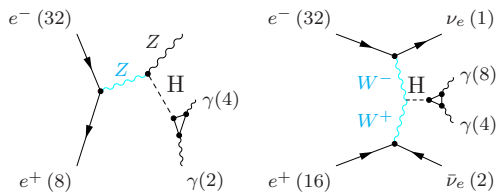


Progress qqH ($H \rightarrow \gamma\gamma$) @250 Gev

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$$H \rightarrow \gamma\gamma$$



external Z in the left hand plot decaying to: $Z \rightarrow l^+l^-$, $Z \rightarrow \nu\bar{\nu}$, $Z \rightarrow q\bar{q}$

Expected # events ($Br = 0.00228$)

● $MH=125$, $\sqrt{s} = 250$: 182 (18 + 44 + 120(*)) (($L=250 \text{ fb}^{-1}$))

(*) Decay Branch being discussed today.

- Checking the reason why $2f/4f$ contributions very large (see backup).
 - kekcc shutdown: analysis code unavailable for such reason.
- Improving optimisation cuts macros, plotting all event variables, revisiting TMVA.

Plan

- Final selection with TMVA.
- I will study what approach provide better result: 1 discriminator VS > 1 discriminator. (*)

(*) One discriminator to separate signal from all the backgrounds or to training several discriminators separating the signal from a particular background.

γ isolation

- Not included in my preselection.
- In the last report cut table no isolation cut appear (see cuts below).
 - Many non isolated photons from 2f, 4f pass these selection.

Preselection

Cut2 : cut2 nPfos > 20

Cut3 : cut3 pt1 + pt2 > 55

Cut4 : cut4 costheta1 < 0.95) & costheta2 < 0.95

Cut5 : cut5 e1 + e2 > 125

Cut6 : cut6 40 < e1 < 100 & 40 < e2 < 100

Cut7 : cut7 -0.95 < cos(1,2) < -0.58

Cut8 : cut8 missE < 30

Cut9 : cut9 missEt < 20

Cut10 : cut10 pt(H) > 30