Status on 2 photon final states for t→cH($\gamma\gamma$)

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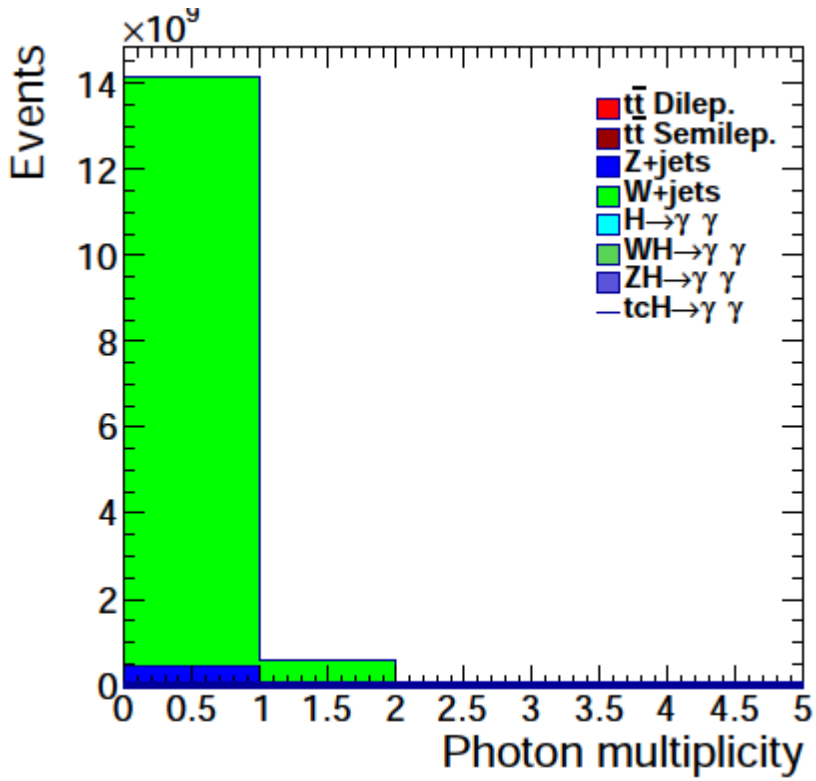
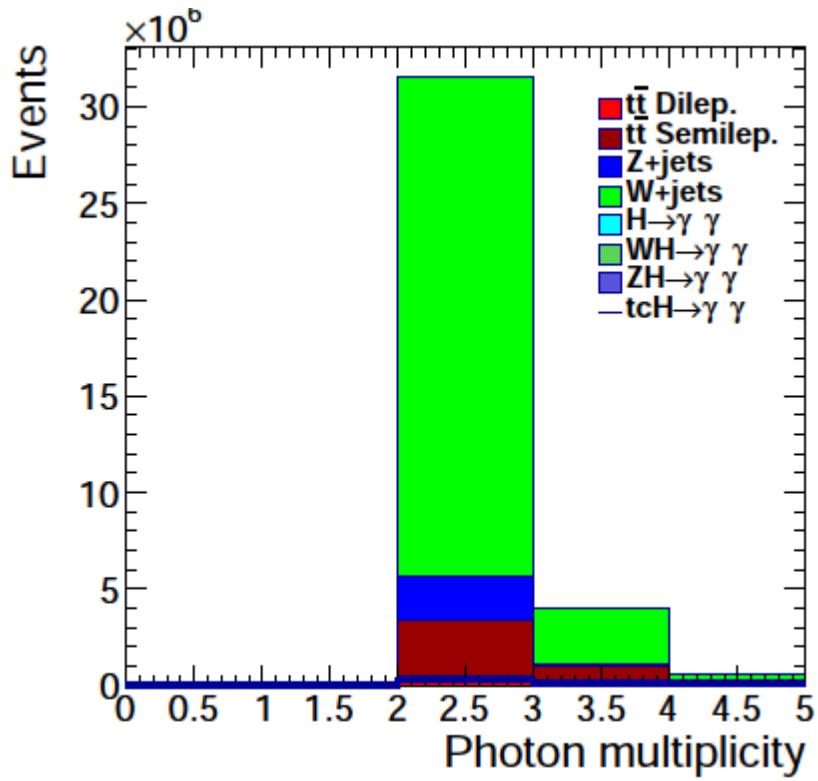
Samples

- Luminosity = 100 fb^{-1}
- Cross sections (scale)
  - $t\bar{t}$ Dilepton : 70.7643 pb (4.55)
  - $t\bar{t}$ Semilepton : 147.644 × 2 pb (52.2 and 12.5)
  - H → $\gamma\gamma$: 0.0743508 pb (12.5)
  - W + 0 jets : 130670 pb (0.11)
  - W + 2 jets : 11879.1 pb (14654)
  - Z + 0 jets : 4178.37 pb (144)
  - Z + 2 jets : 443.25 pb (532)
  - WH → $\gamma\gamma$: 0.003235 pb (0.004)
  - ZH → $\gamma\gamma$: 0.00174967 pb (0.002)
  - $t\bar{t} \rightarrow bWcH\ (\gamma\gamma)$: 5 pb (0.25)

Pre-selection with two photons

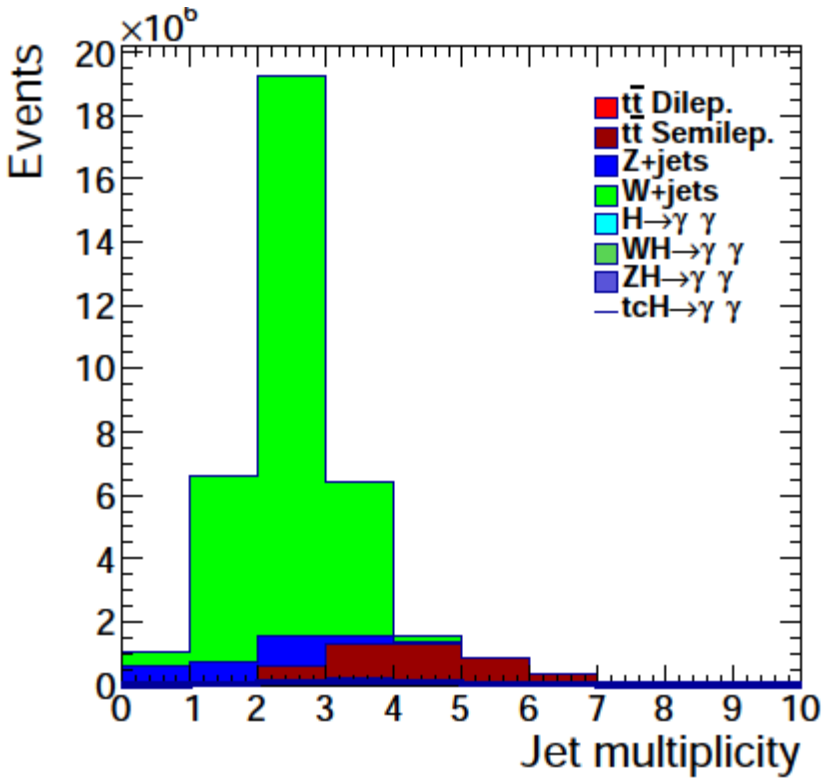
Photon : $p_T > 20$ GeV, $|\eta| < 2.5$
No isolation yet for photons

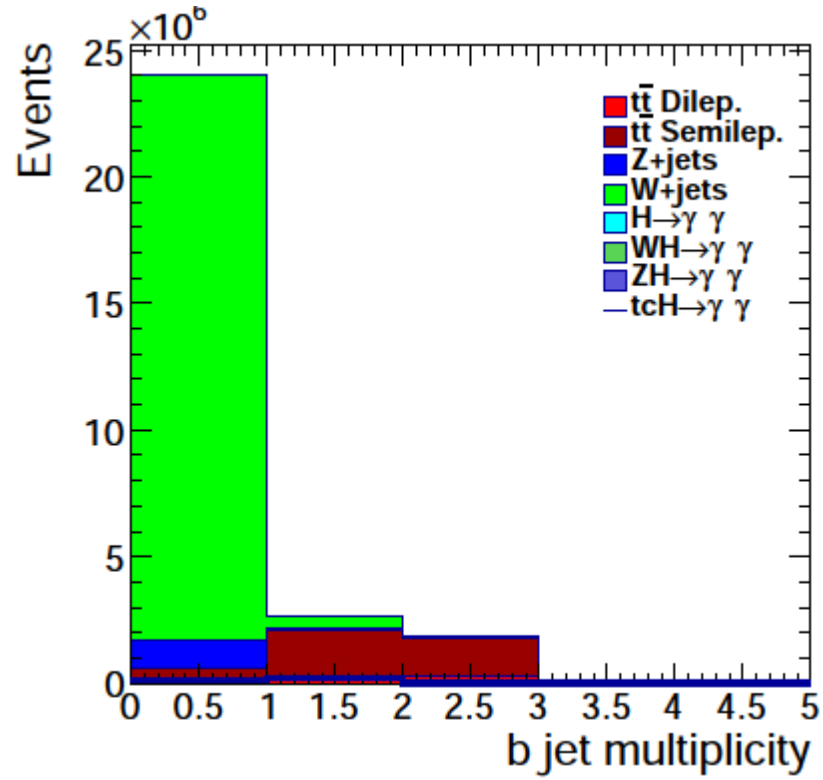




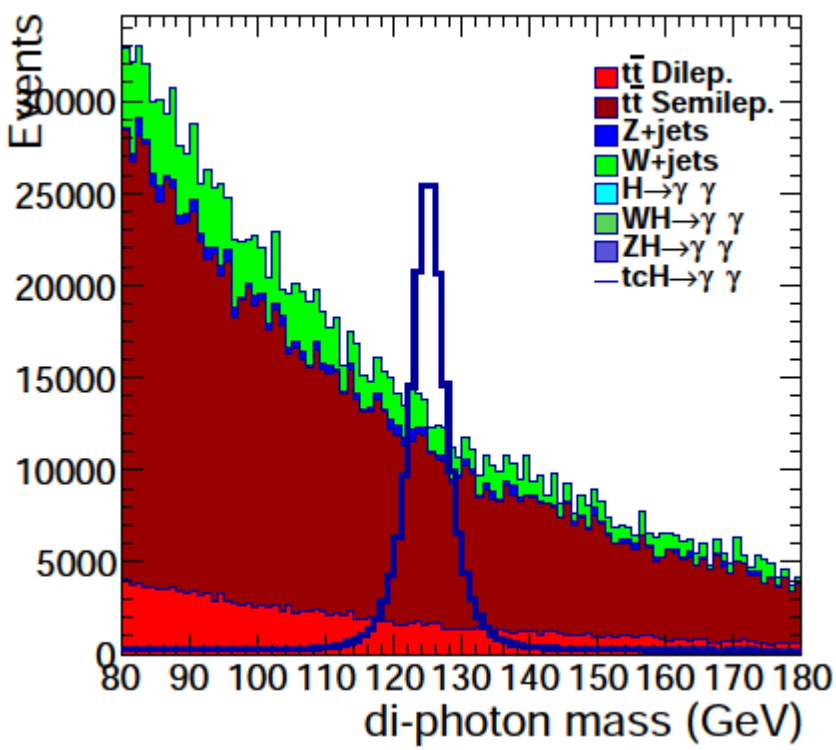
Two photon selection

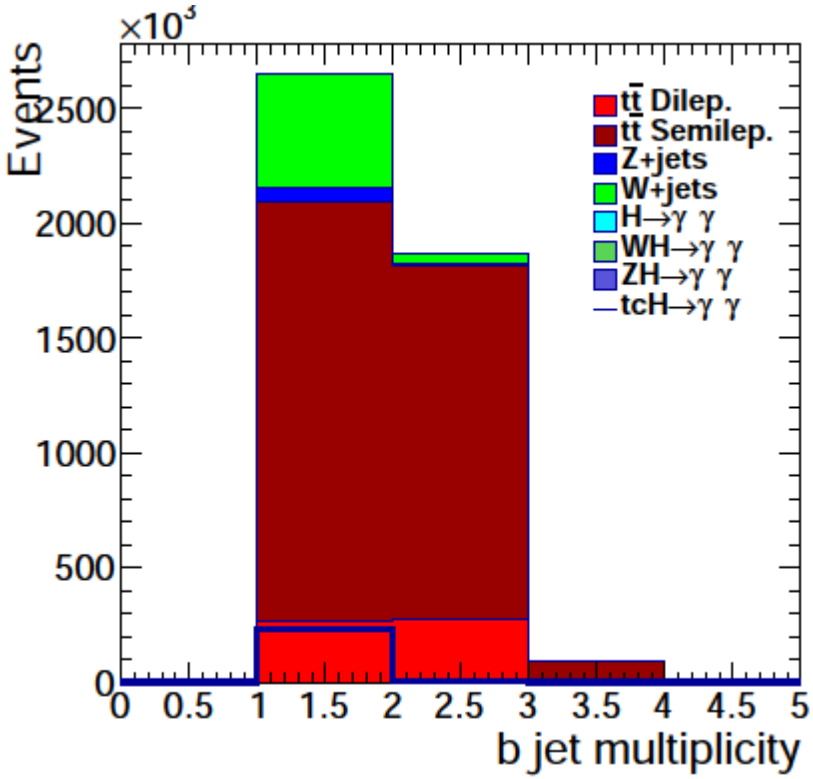
Jet : $p_T > 30$ GeV, $|\eta| < 2.5$, EEoverHE > 0.3
No cleaning yet





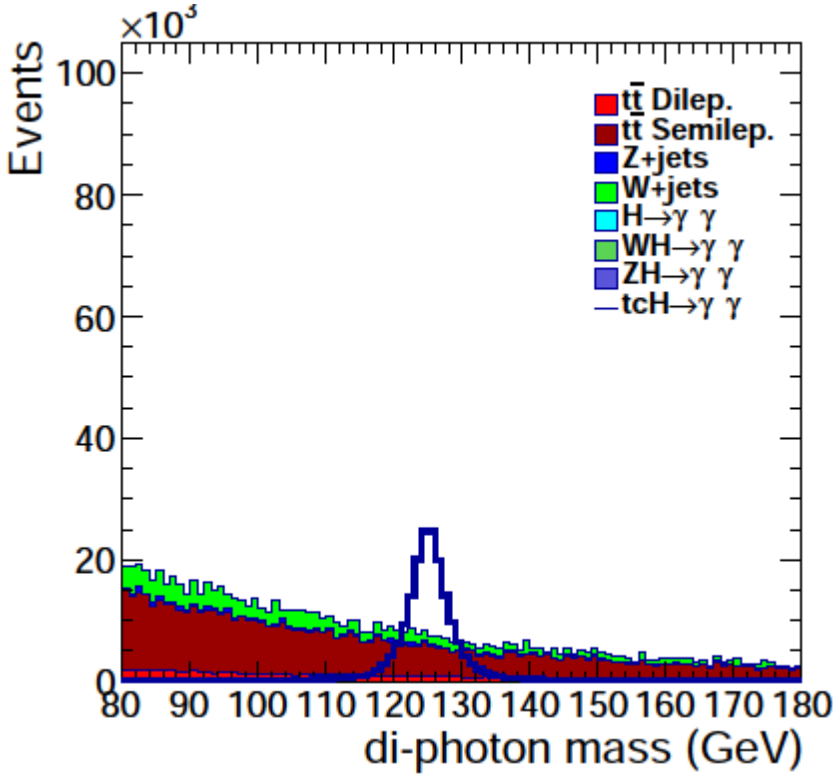
Two photons, two jets, at least one b-jet





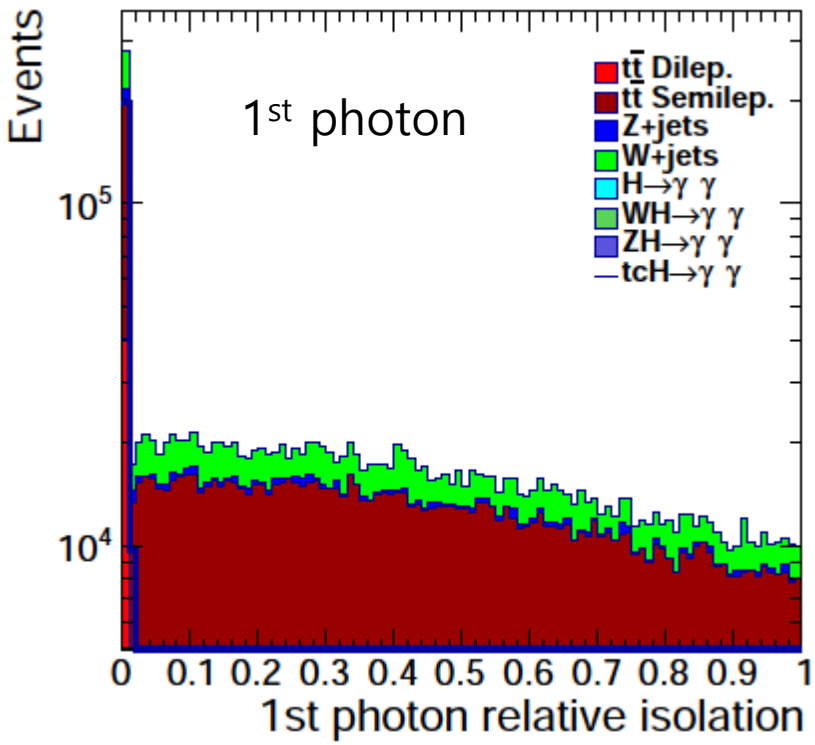
Final selection

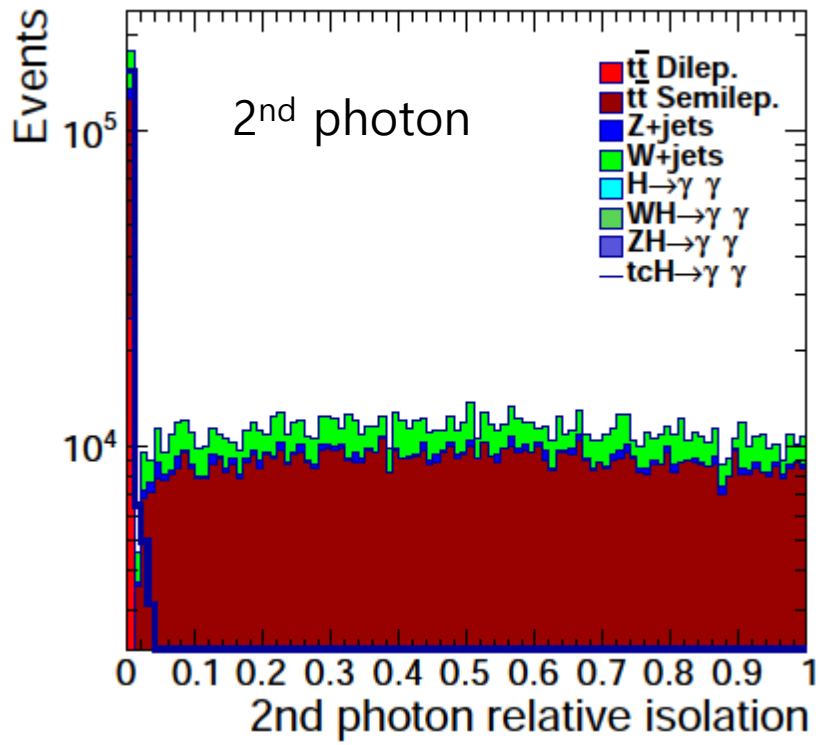
Two photons, two jets, only one b-jet



Process	Final selection
$t\bar{t}$ dilepton	265825
$t\bar{t}$ semi-lepton	1789060
Z+jets	60040
W+jets	491658
H $\rightarrow \gamma\gamma$	0.11
V(H $\rightarrow \gamma\gamma$)	0.1
$t\bar{t} \rightarrow bWcH(\gamma\gamma)$	222112

Isolation

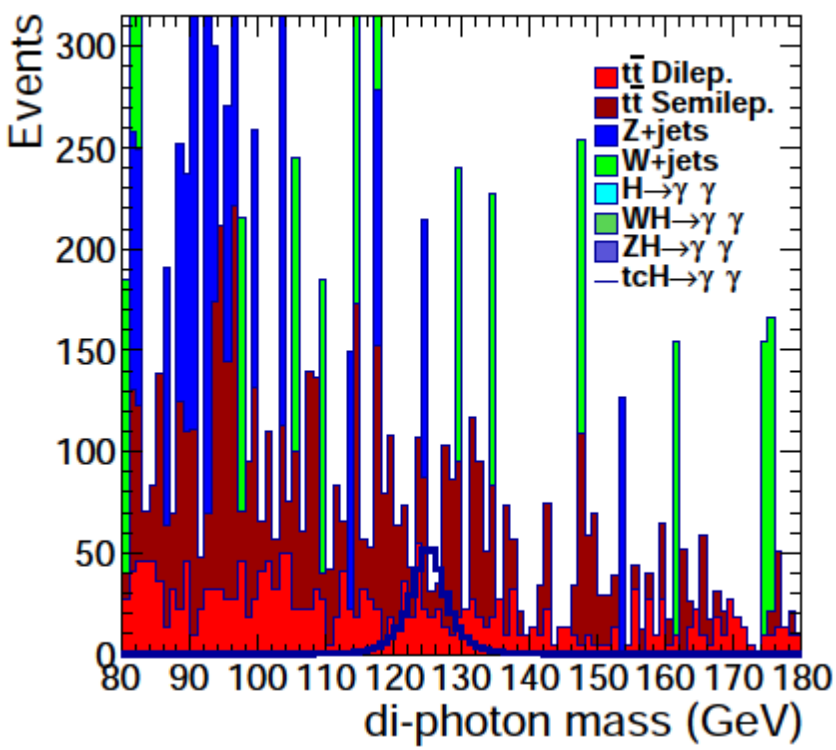




- Relative Isolation for photons
  - sumPT03/pt < 0.02

After isolation

- Taking into account Br($H \to \gamma\gamma$)



Process	Final selection
$t\bar{t}$ dilepton	5497
$t\bar{t}$ semi-lepton	15032
Z+jets	4457
W+jets	6951
H $\to \gamma\gamma$	0.11
V(H $\to \gamma\gamma$)	0.1
$t\bar{t} \to bWcH(\gamma\gamma)$	375

$$\frac{S}{\sqrt{S+B}} = 2.1$$