# WgamgamMCFilt

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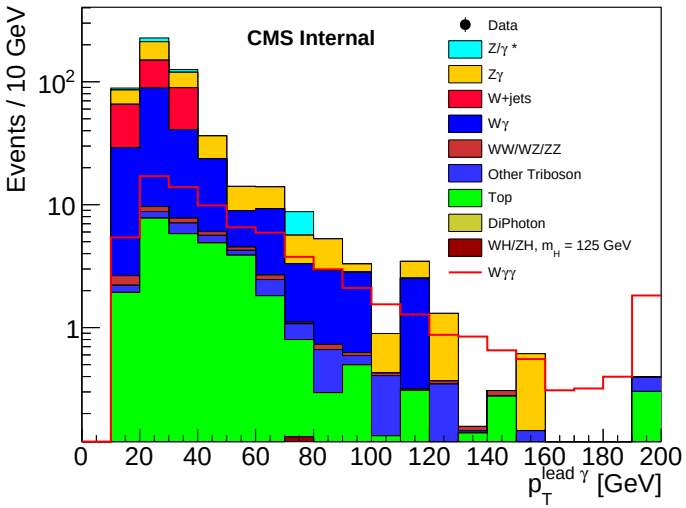
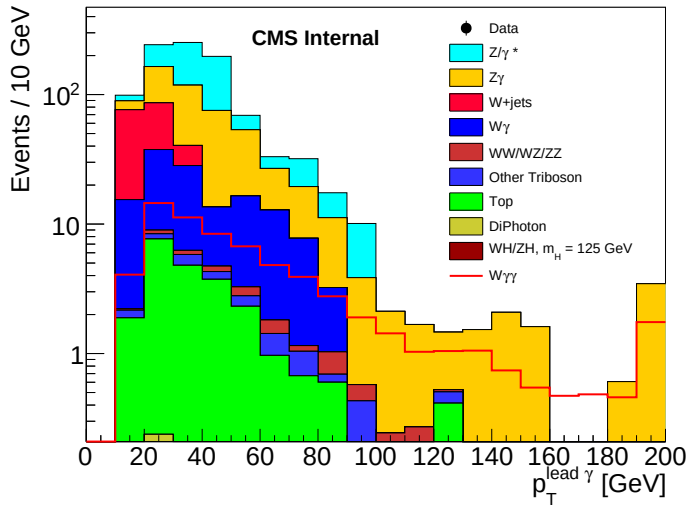
# The problem

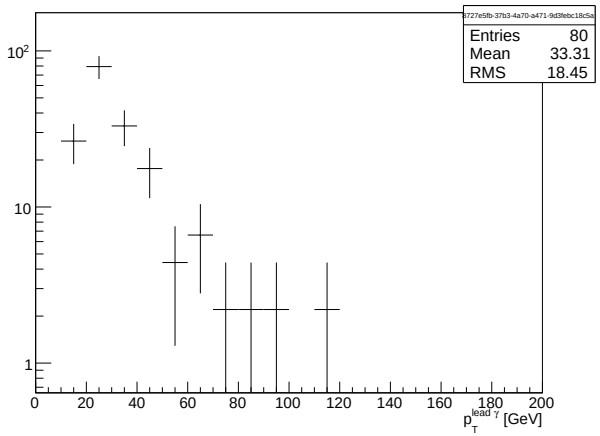
- $W\gamma$ and $Z\gamma$ are the main backgrounds to the $W\gamma\gamma$ signal
- Despite the large sample size, a small number of events survive the full event selection
- This is particularly the case at large photon $p_T$, where we have the most signal sensitivity as well as TGC sensitivity
- Propose creating new samples with a $p_T$ cut on the leading photon



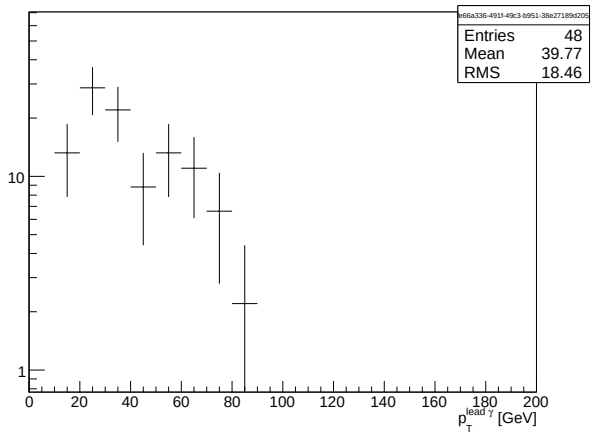



# Individual distributions

Muon Channel – $W\gamma$




Electron Channel – $W\gamma$

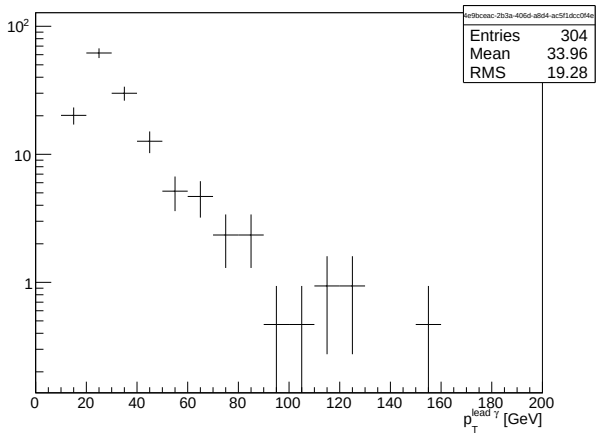



| | Lead photon $p_T$ cut | Backroung predition | stat uncertainty (%) |
|---|---|---|---|
| Muons | 15 GeV | 176 ± 19.7 | 11 |
| | 40 GeV | 37.5 ± 9.08 | 24 |
| | 50 GeV | 19.8 ± 6.61 | 33 |
| | 60 GeV | 15.4 ± 5.83 | 38 |

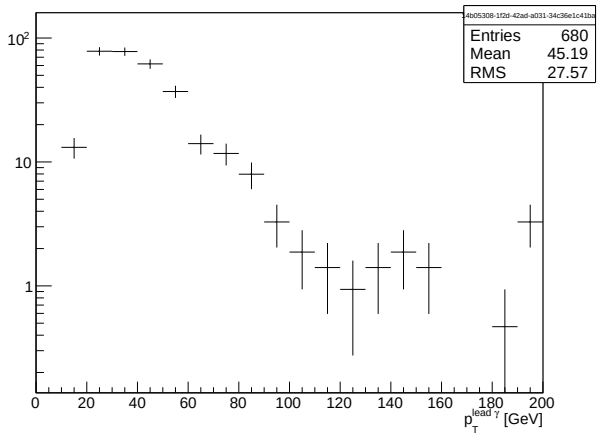
| | Lead photon $p_T$ cut | Backroung predition | stat uncertainty (%) |
|---|---|---|---|
| Electrons | 15 GeV | 106 ± 15.3 | 14 |
| | 40 GeV | 41.9 ± 9.60 | 23 |
| | 50 GeV | 33.1 ± 8.53 | 26 |
| | 60 GeV | 19.8 ± 6.61 | 33 |

# Individual distributions

Muon Channel – $Z\gamma$




Electron Channel – $Z\gamma$




| | Lead photon $p_T$ cut | Backroung predition | stat uncertainty (%) |
|---|---|---|---|
| Muons | 15 GeV | 142 ± 8.2 | 5.8 |
| | 40 GeV | 30.5 ± 3.78 | 12 |
| | 50 GeV | 17.8 ± 2.89 | 16 |
| | 60 GeV | 12.7 ± 2.43 | 19 |

| | Lead photon $p_T$ cut | Backroung predition | stat uncertainty (%) |
|---|---|---|---|
| Electrons | 15 GeV | 318 ± 12.2 | 3.8 |
| | 40 GeV | 148 ± 8.34 | 5.6 |
| | 50 GeV | 86.7 ± 6.37 | 7.3 |
| | 60 GeV | 49.7 ± 6.61 | 13 |