

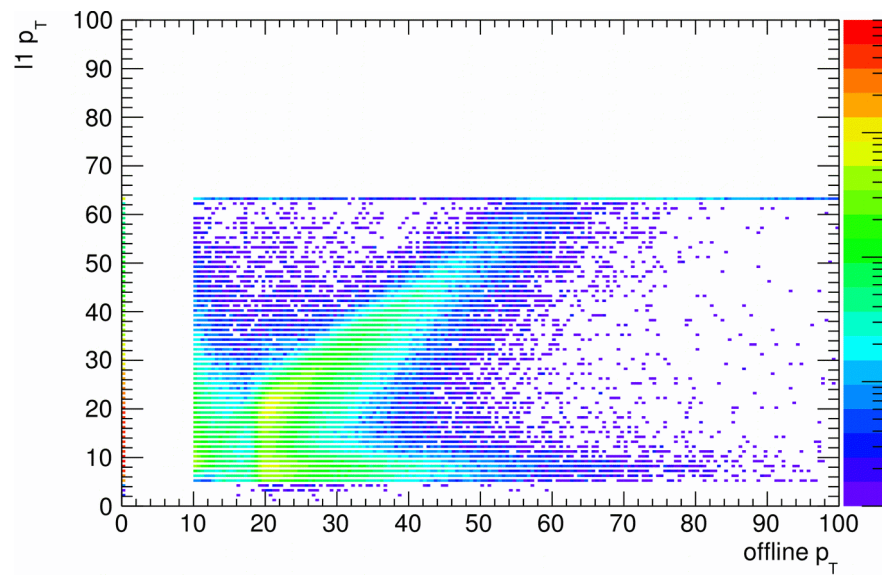
# L1 EGamma Alternative Seeding

- Reminder: see large inefficiency using the “L1 EGcands” as seeds for photons. Looking at alternative seeds with acceptable rate.
- Today:
  - Maximum background-subtracted region within eta of 1.74 (similar (identical?) to single track seed trigger)
- Soon:
  - 2x2 and 3x3 jets with  $|\eta| < 1.74$
- Some information collected at this Google Doc:
  - [https://docs.google.com/spreadsheets/d/1I\\_T7Zs-IBCyR4UMiN5KEQ648sviSQMPWDywmtjefBKKQ/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1I_T7Zs-IBCyR4UMiN5KEQ648sviSQMPWDywmtjefBKKQ/edit?usp=sharing)

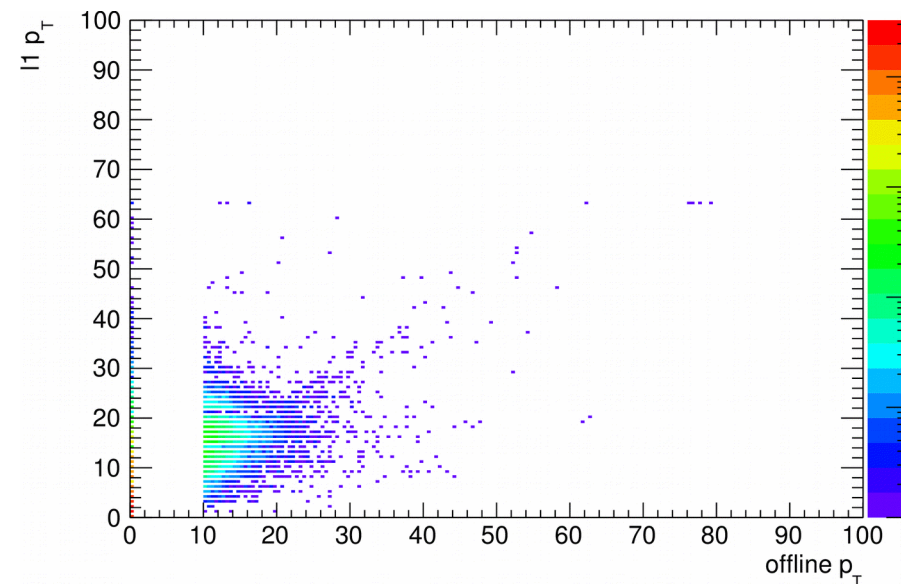
# Offline selection

- $\text{if}(\text{TMath}::\text{Abs}(\text{photon\_eta}[i]) < 1.4791)$
- spike cuts:
  - $\text{if}(\text{TMath}::\text{Abs}(\text{seedTime}[i]) < 3)$
  - $\text{if}(\text{swissCrx}[i] < 0.9)$
  - $\text{if}(\text{sigmaletaeta}[i] > 0.002)$
  - $\text{if}(\text{sigmalphi}[i] > 0.002)$
- No isolation or H/E cut on offline photons
- Using 2011 MB data and photon20-triggered data, 5.02 TeV MB Hydjet

# L1-Offline correlation (emcands)



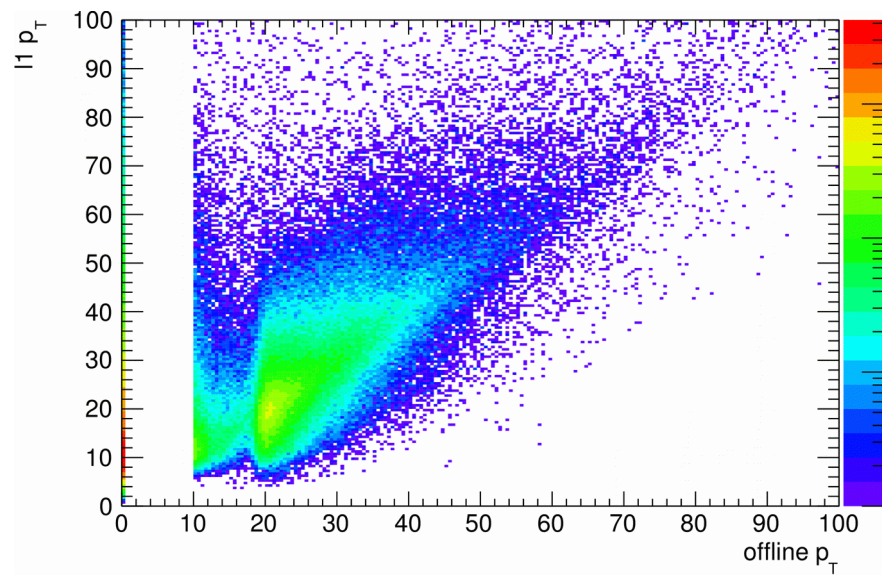
2011 Photon-triggered Data



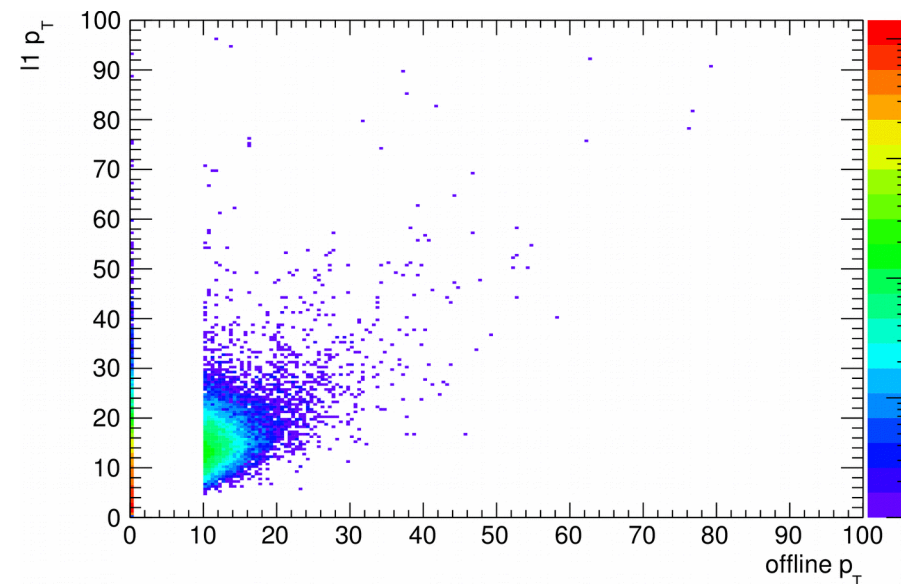
5.02 TeV Hydjet

- Low photon statistics make it hard to tell what is going on in MB samples
- Striation is an artifact of L1 granularity

# L1-Offline correlation (regions)



2011 Photon-triggered Data

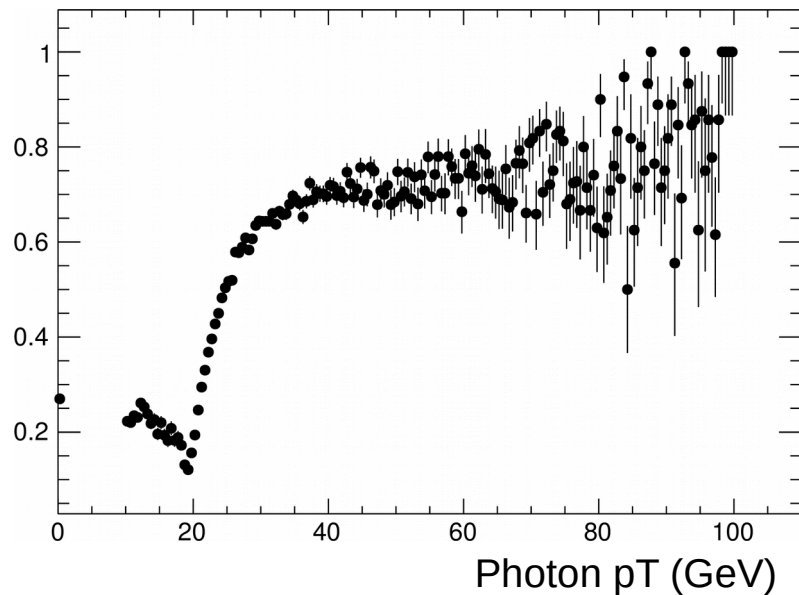


5.02 TeV Hydjet

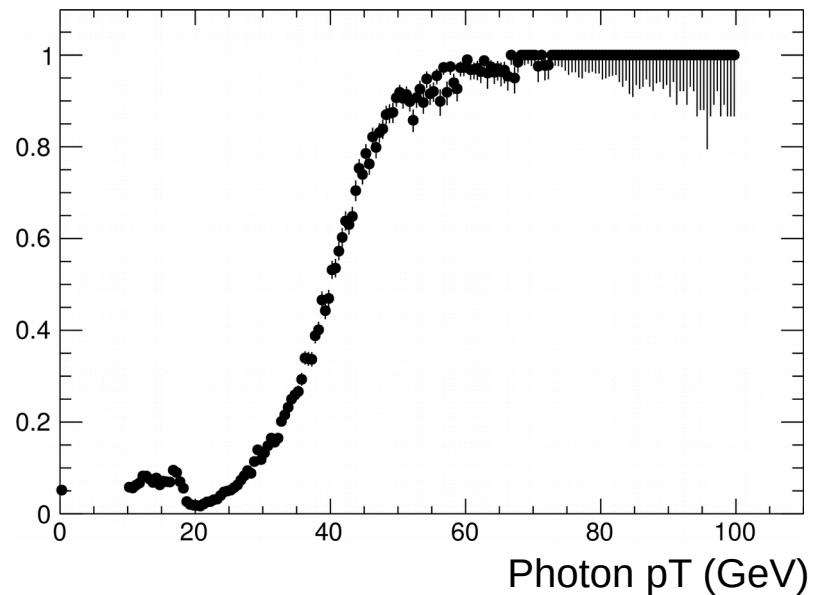
- Low photon statistics make it hard to tell what is going on in MB samples
- Correlation significantly improved in photon-triggered sample

# Turn-On Curves

- Using the 5.02 Hydjet sample at 30kHz:
  - egcand: 493Hz at threshold of 20 GeV
  - regions: 569Hz at threshold of 20.5 GeV (surprisingly similar!)



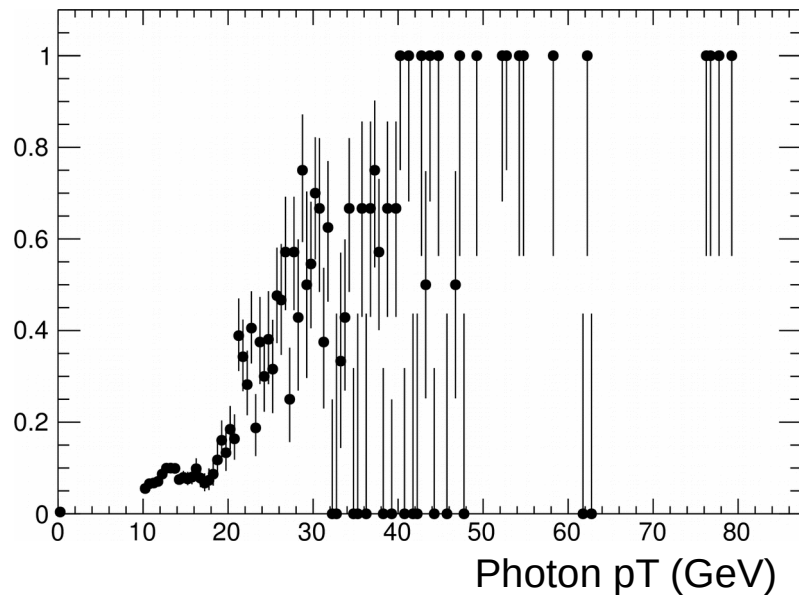
Photon-triggered data,  
egcand seeds 20GeV



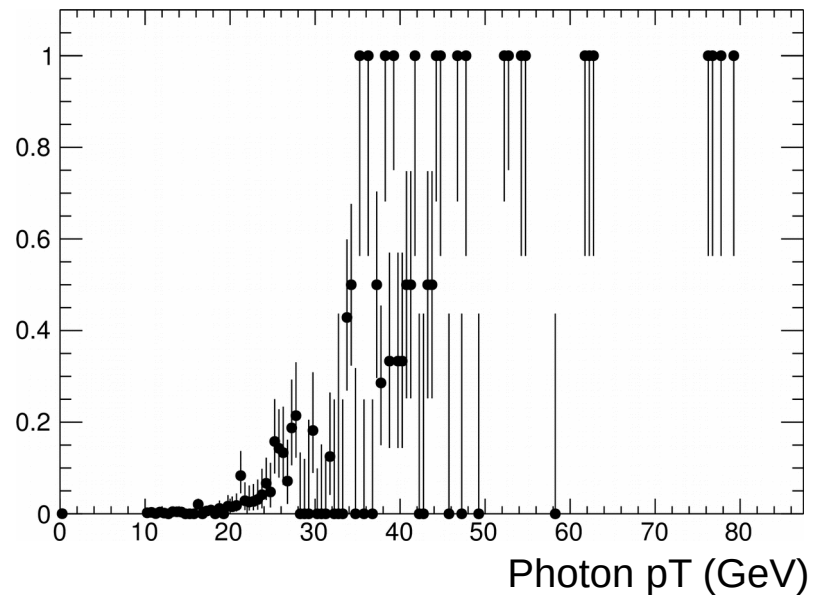
Photon-triggered data,  
region seeds 20.5 GeV

# Turn-On Curves

- Using the 5.02 Hydjet sample at 30kHz:
  - egcand: 493Hz at threshold of 20 GeV
  - regions: 569Hz at threshold of 20.5 GeV (suprisingly similar!)



5.02TeV Hydjet  
egcand seeds 20GeV



5.02 TeV Hydjet  
region seeds 20.5 GeV

# Thoughts

- Reach ~95% efficiency at 60GeV @ ~550 Hz
- Reach ~100% at ~75GeV
  - Can we deal with a 5% loss of efficiency and use a 60GeV HLT trigger? Measuring the inefficiency is possible with prescaled triggers.
- Desperately need photon-embedded 5.02TeV, working on this right now