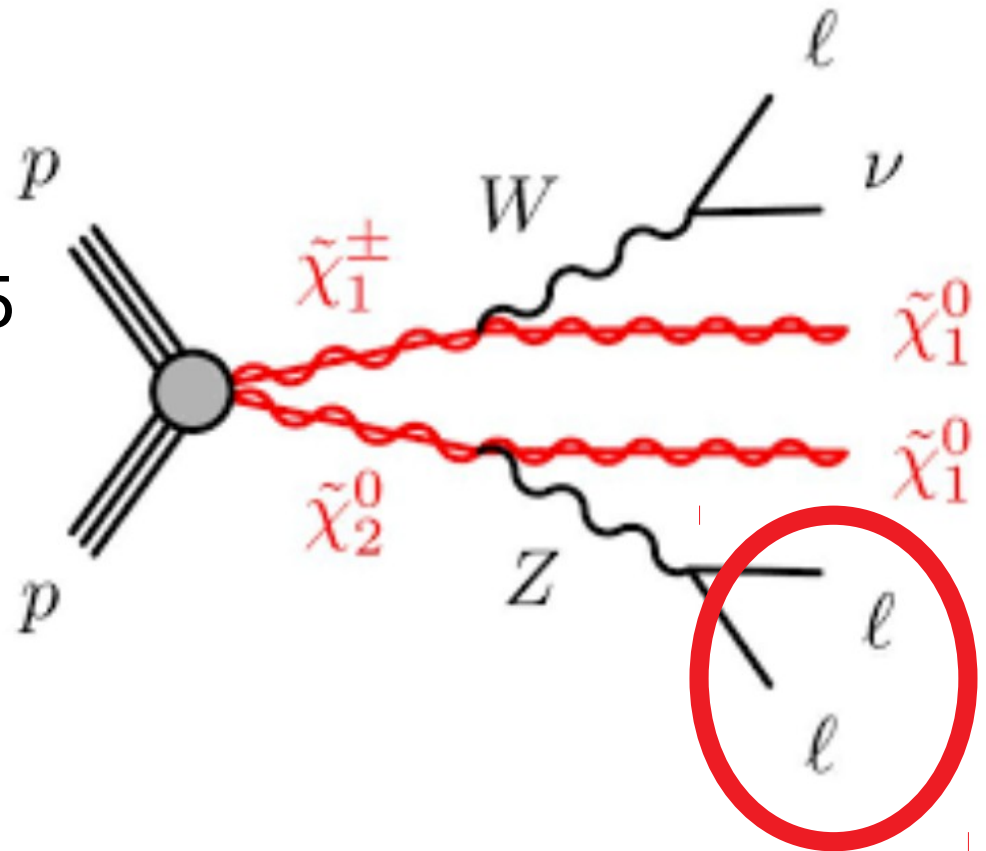


Soft lepton pairs  
from  $\chi^0_2$ -decays  
in compressed Higgsino  
models

# Physical Properties

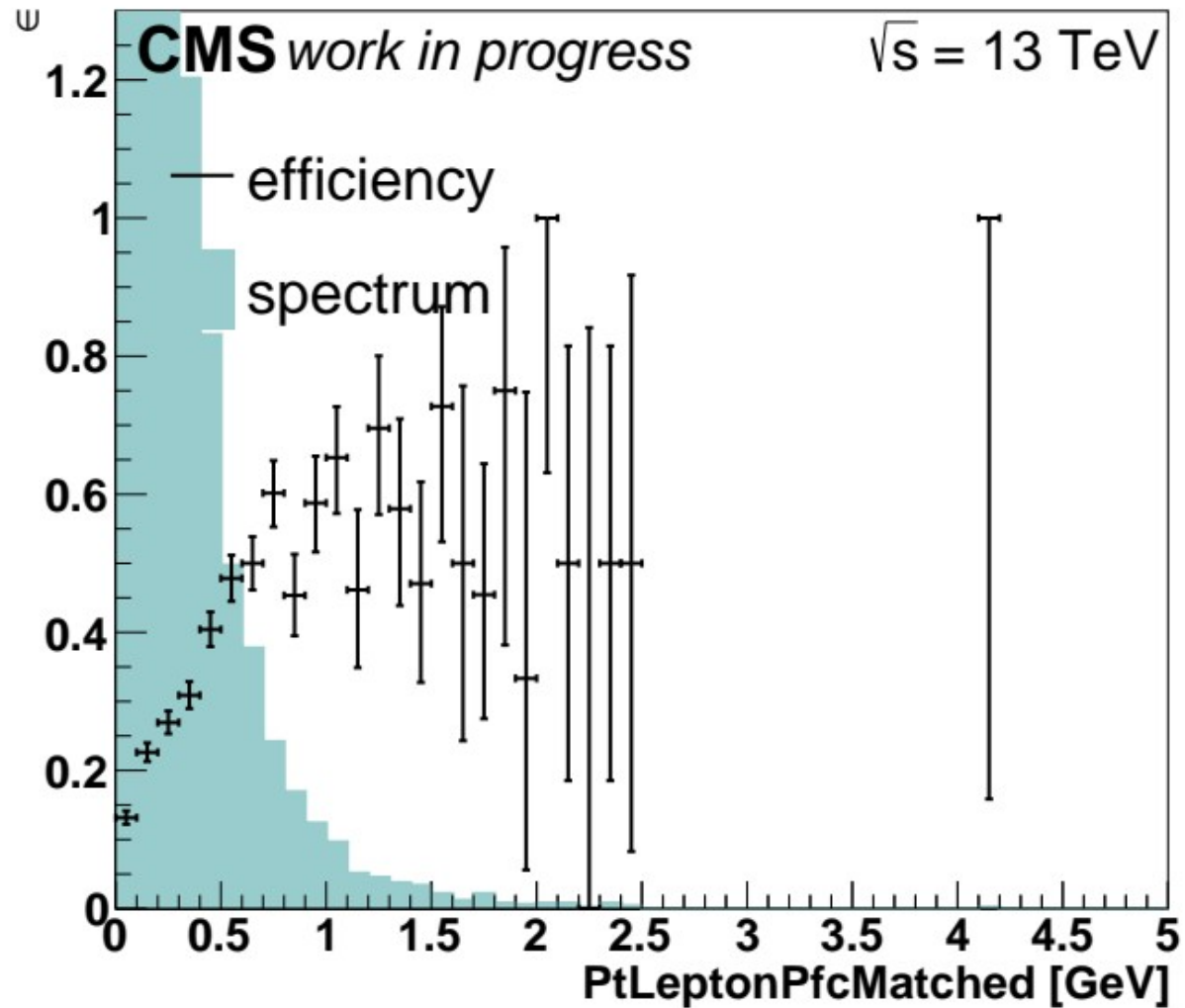
- $\Delta m(\chi^0_2, \chi^0_1) \approx 0.5 \text{ GeV}$
- $\chi^0_2$  decay length  $\sim O(1 \text{ mm})$
- Lepton  $p_T < 1 \text{ GeV}$
- $\Delta R(\text{lepton1}, \text{lepton2}) < 0.05$



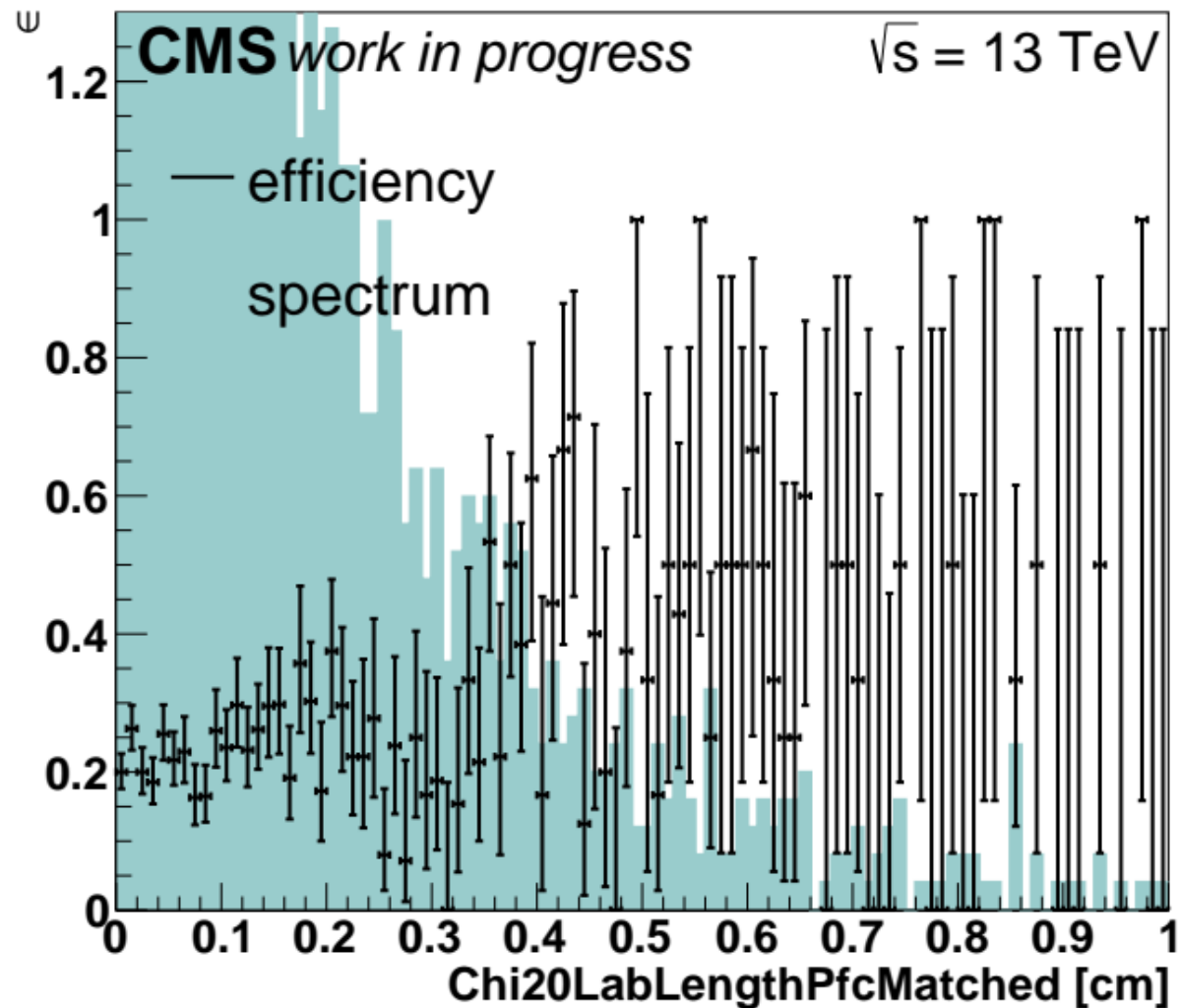
# Approach

- Identify generated leptons coming from  $\chi^0_2$ -decay
- Match to reconstructed **tracks** ( $\Delta R < 0.02$ )
  - Not possible
- Match to reconstructed **PF candidates** ( $\Delta R < 0.02$ )
  - 98%: same PF candidate matched to both leptons
  - 92%: matched PF candidate is photon
  - **Di-lepton system is reconstructed as photon**

# Reco efficiency vs. lepton $p_T$



# Reco efficiency vs. $\chi^0_2$ decay length



# Outlook

- Look at tracker **hit pattern** in direction of photon
  - Look at **calorimeter** cluster
- 
- How to tag lepton pairs?
  - How to estimate invariant mass?

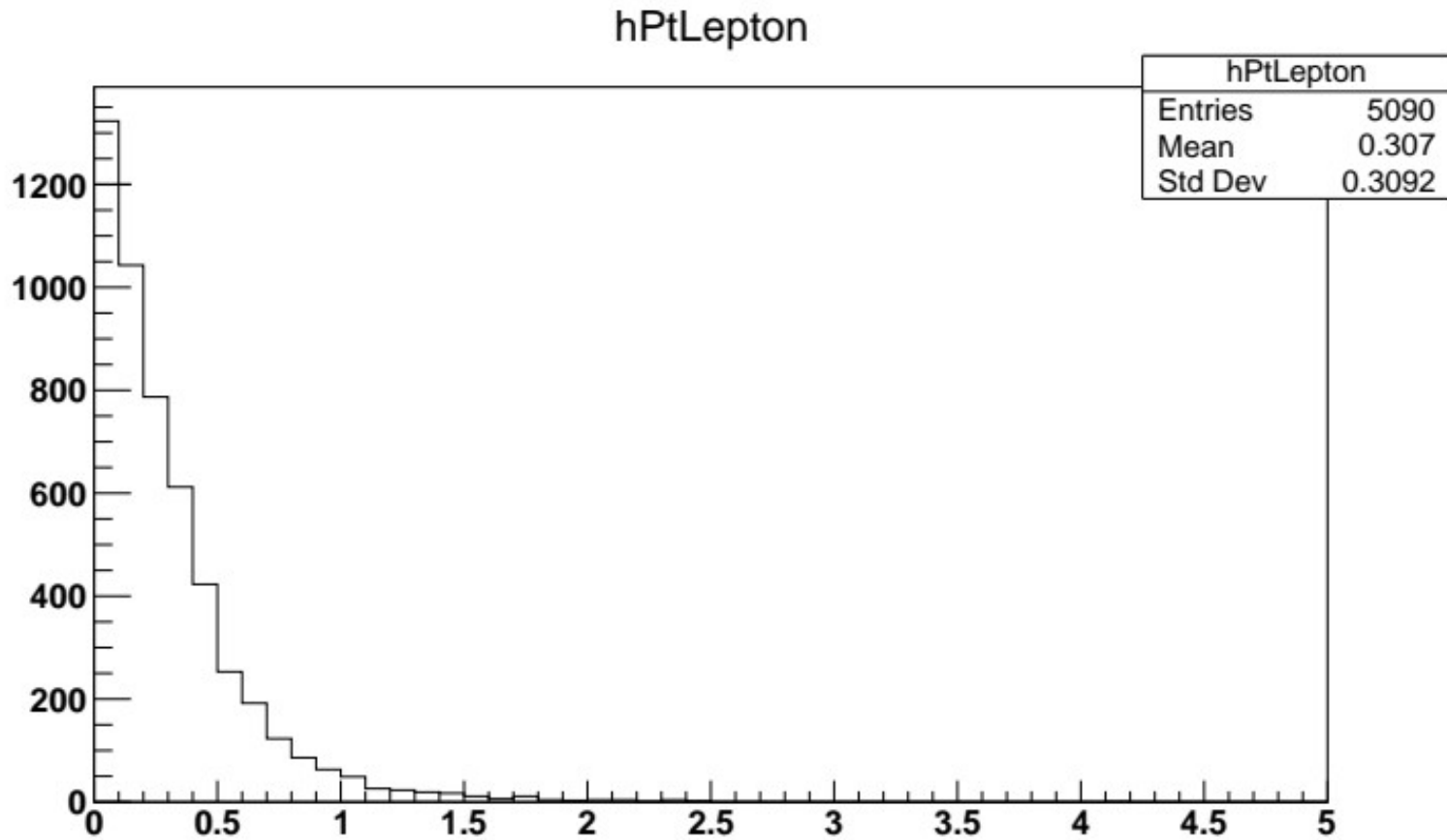
Backup

pT chi20

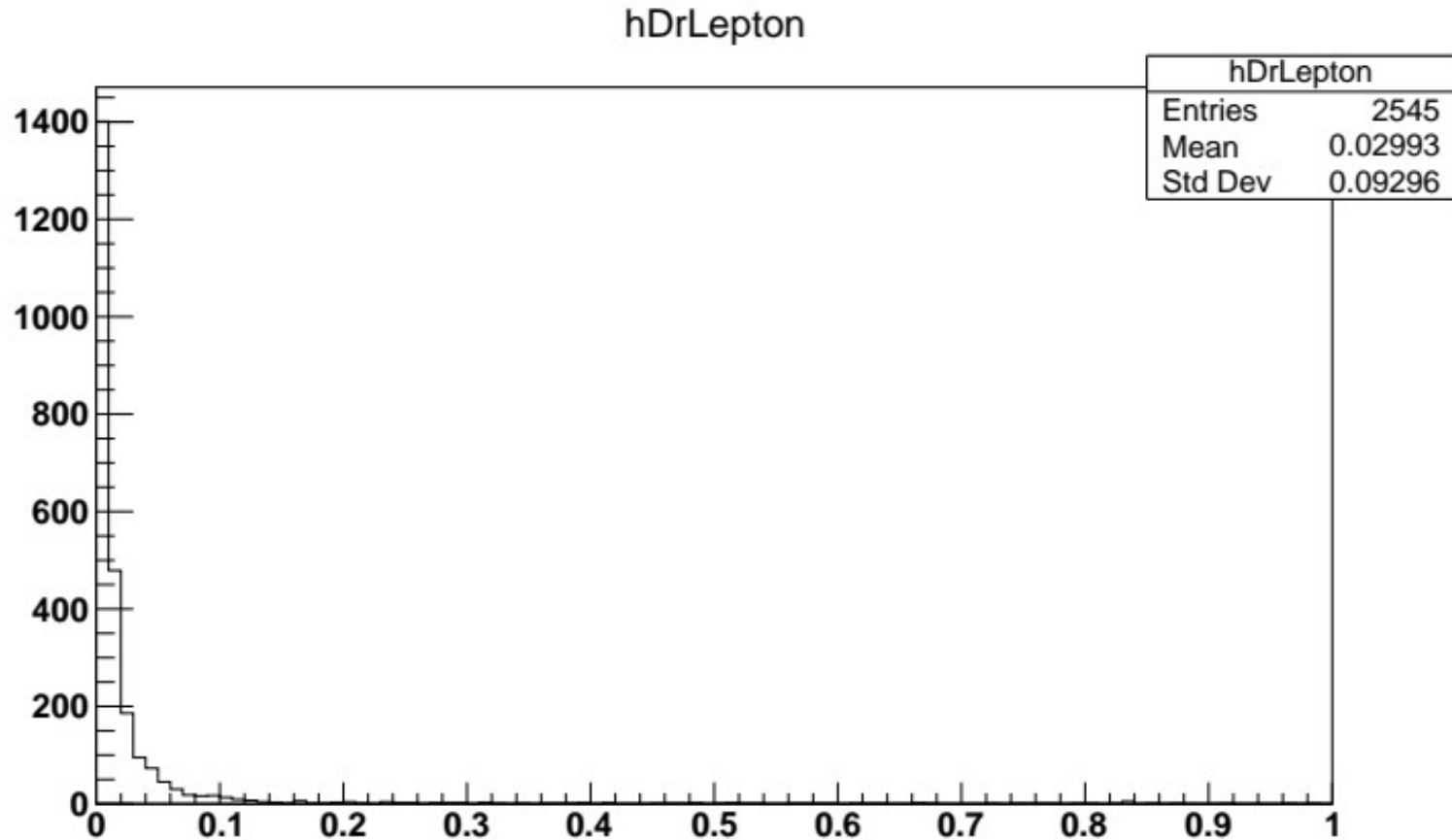


$p_T Z/\gamma$

# pT lepton



# dR(lepton1, lepton2)



$dR(\text{lepton, track})$

# dR(lepton, PFc)

