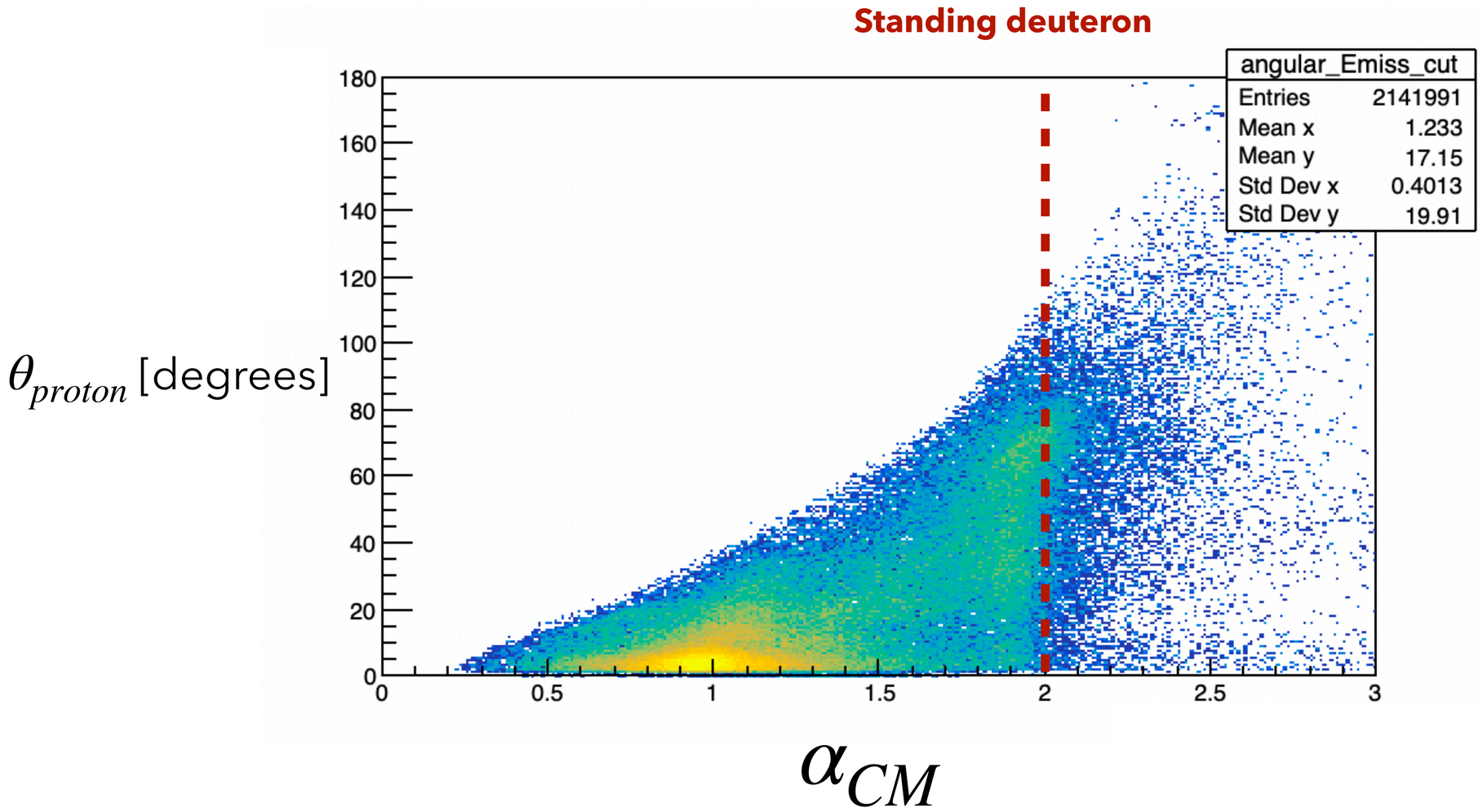
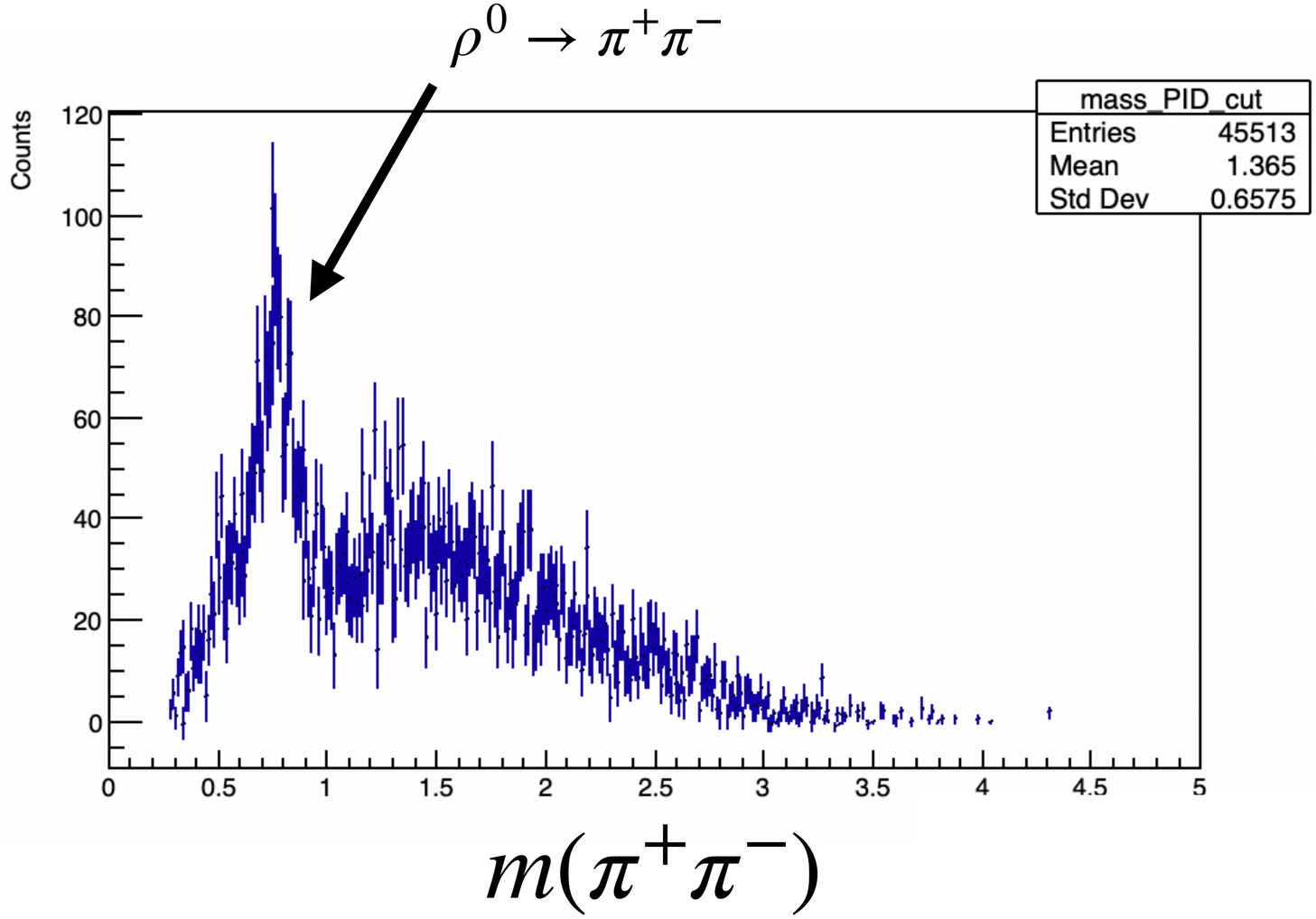
$(\gamma, \rho^0 pp)$ Background Study

Jackson Pybus

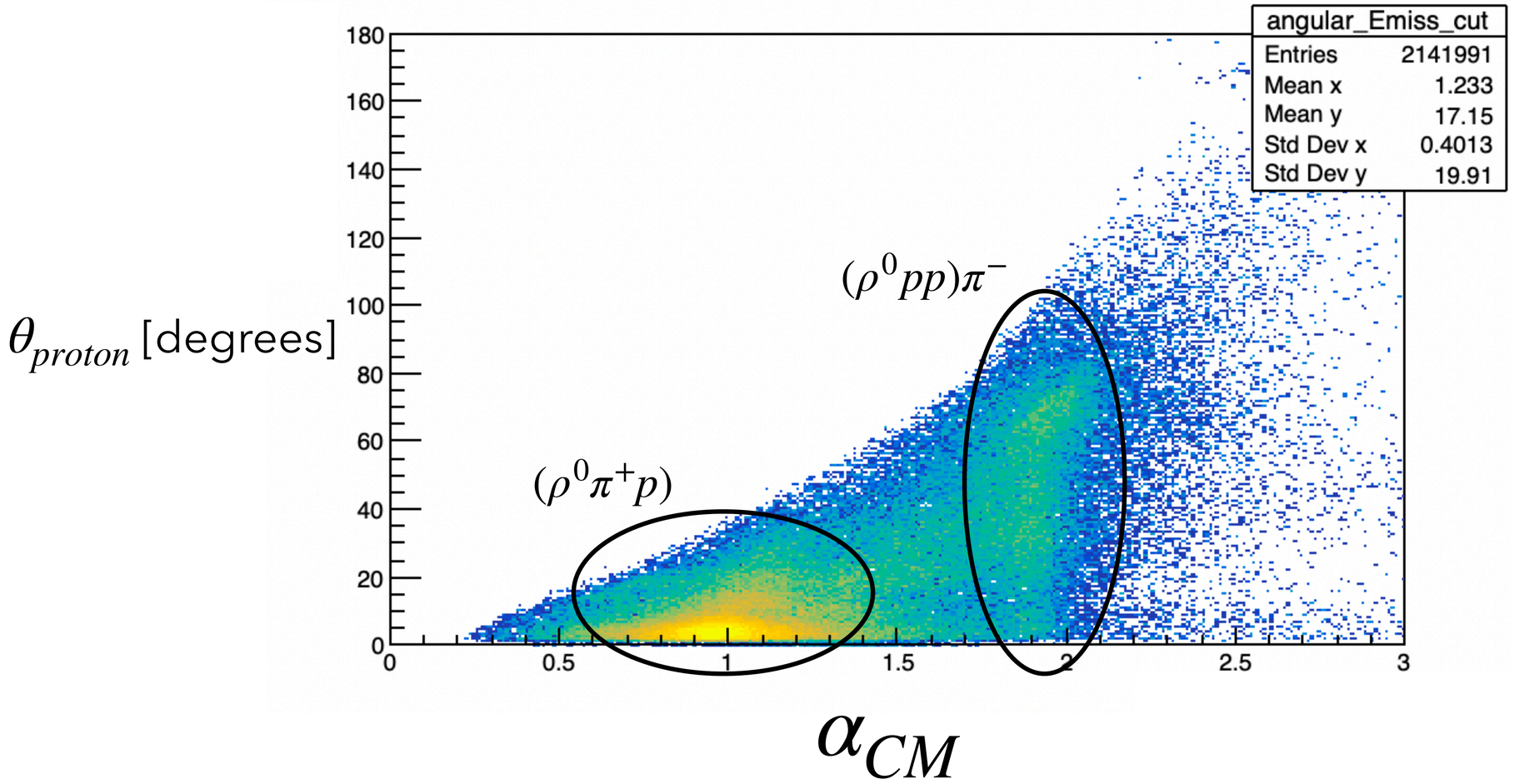
$(\gamma, \rho^0 pp)$ Events are visible in deuterium



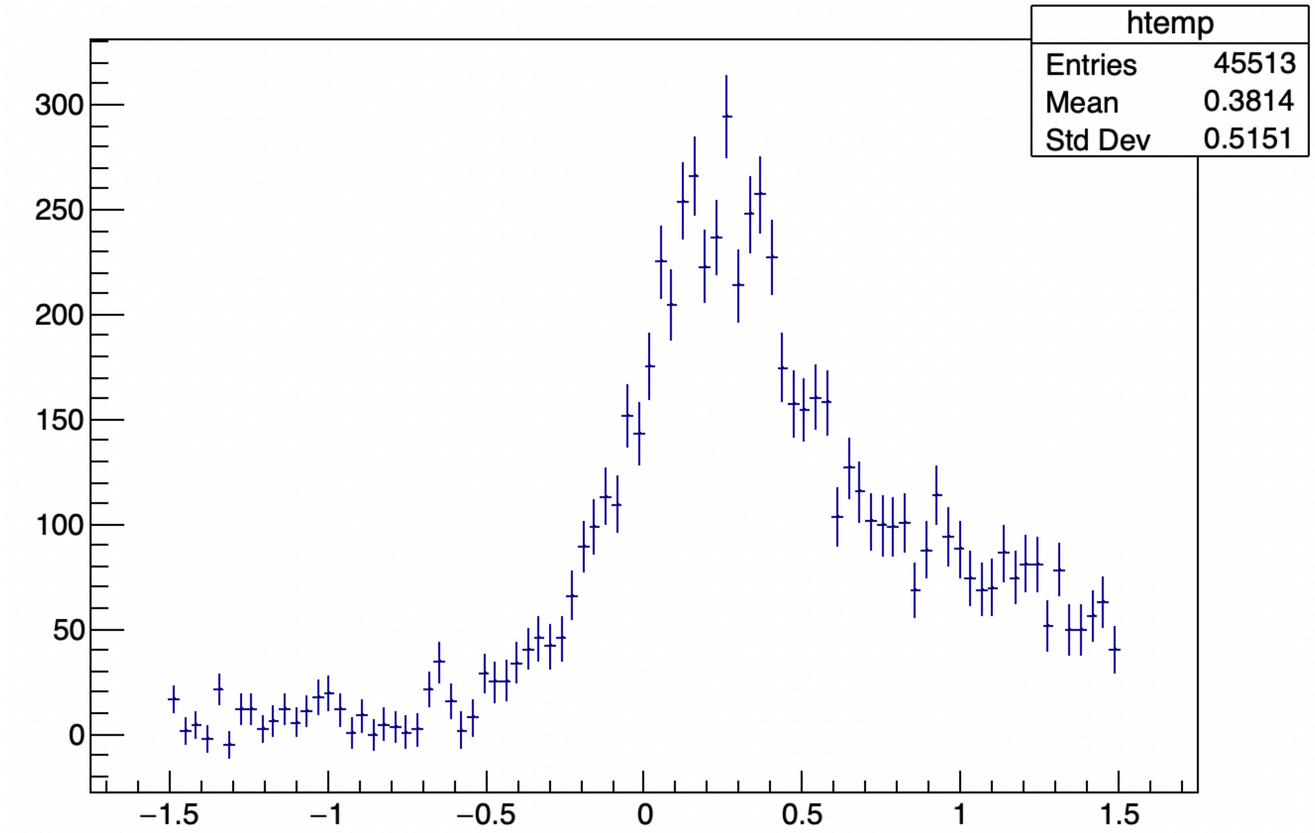
This are in fact $\rho^0 \to \pi^+\pi^-$ decays and double-proton



What are the backgrounds?



Missing energy can't distinguish the extra pion, which has $p \lesssim 200$ MeV



$2mN + E_\gamma - E_{lead} - E_{recoil} - E_{\rho^0}$ [GeV]

Possible approaches to solve this problem

- Problem: in hard (large-$|t|$) photoproduction making a soft pion may be too easy
- Solutions:
  - Find a physics cut to eliminate extra pions in the final state?
  - Measure $\gamma np \to \rho^0 \pi^- pp$ directly to do feed-down and address background?
  - Move to channel like ϕpp where pion production might be suppressed?
  - Use $(\rho^- pp)/(\rho^- p)$ ratio to validate np-dominance?