# Progress Update

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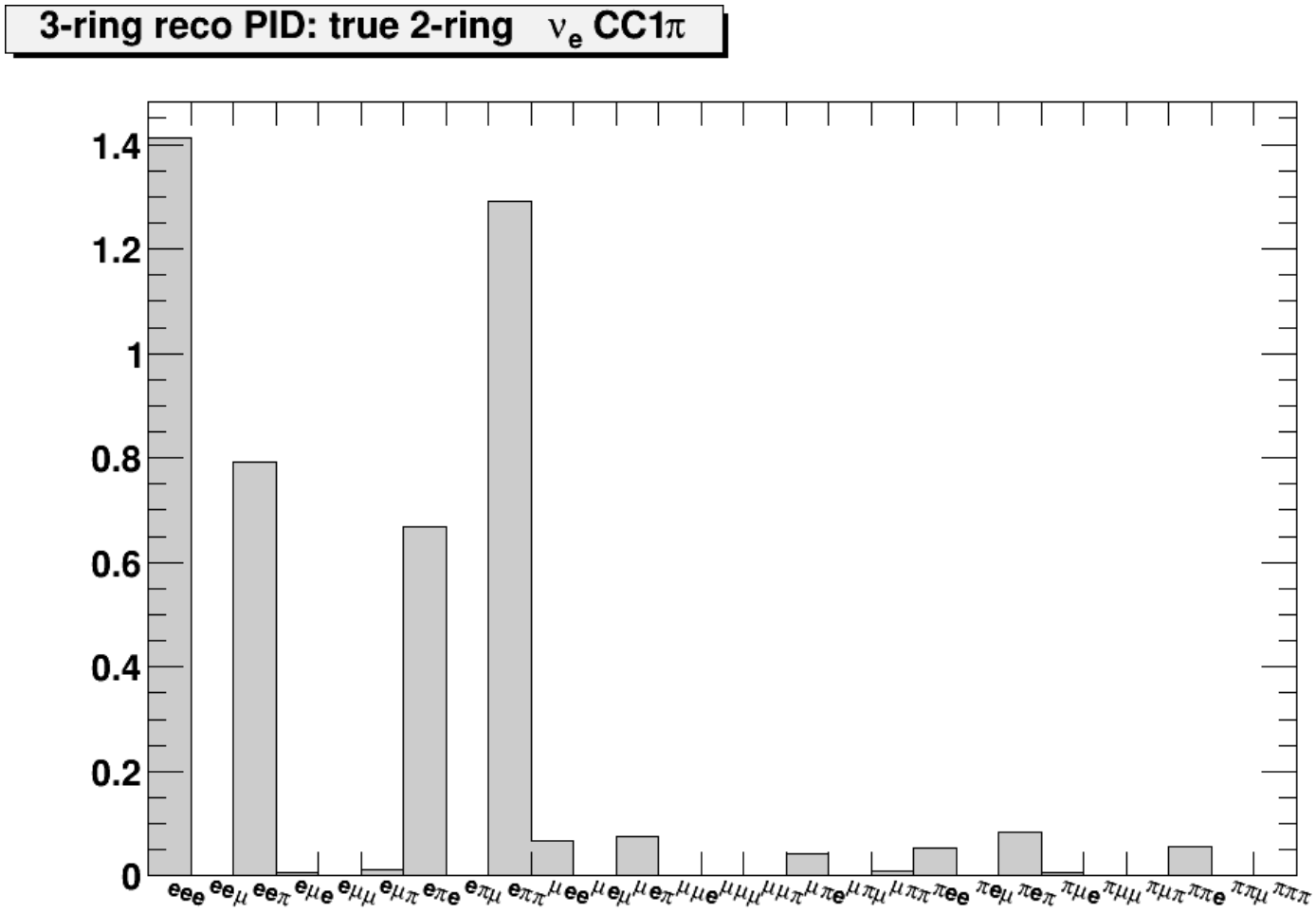
UofT Neutrino/DM Meeting
May 30, 2018

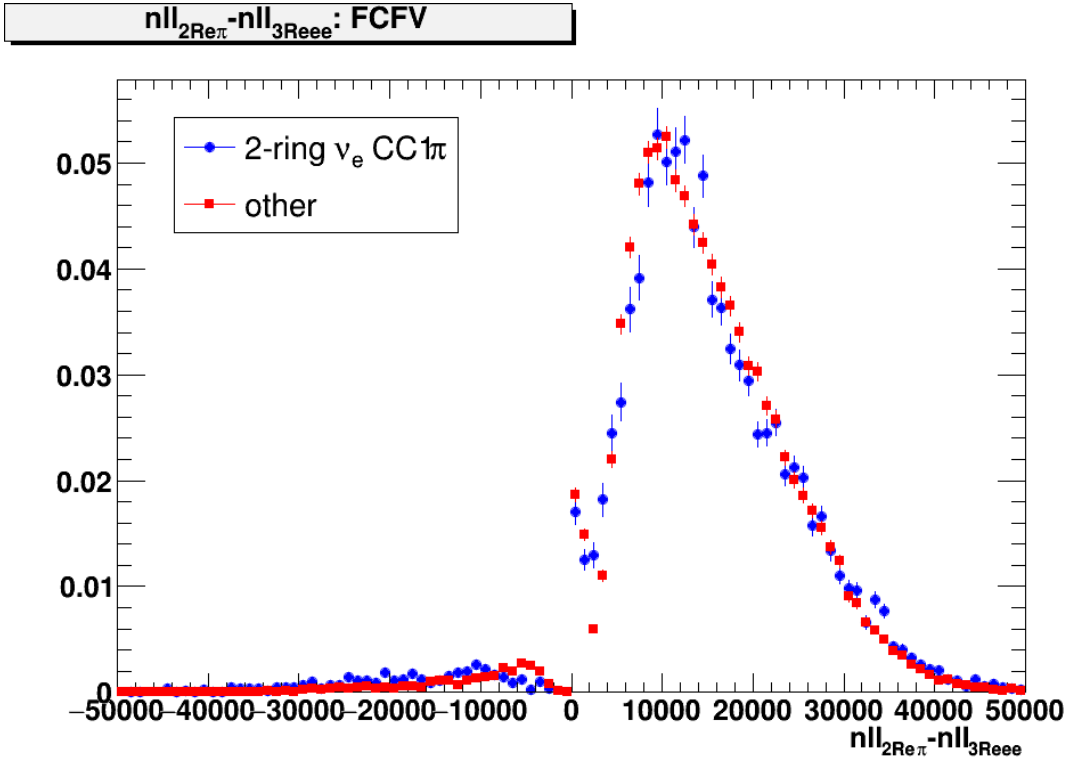
# Likelihood Ratios

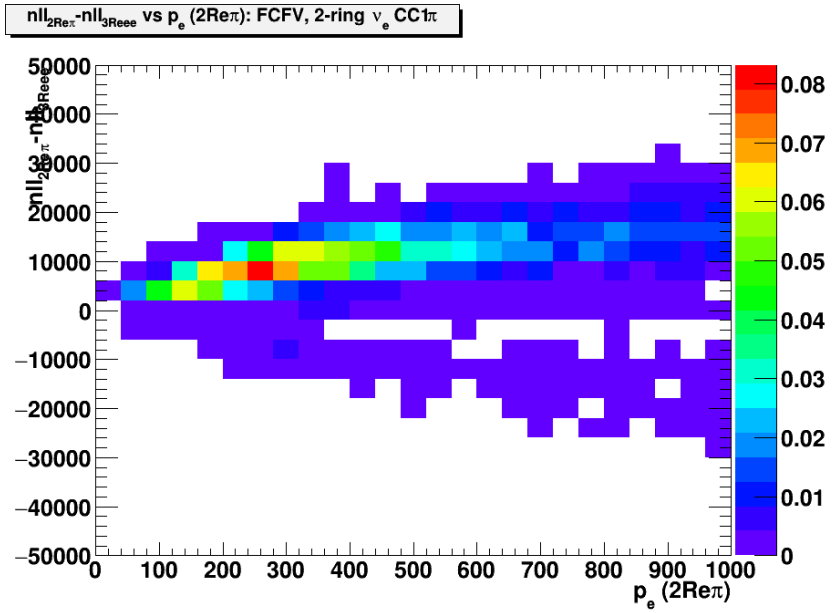
- Look at likelihood ratios **before 2-ring cut**
  - Showed 1R and 2R likelihoods last week
  - Following slides show 3R likelihoods
    - Not all events have 3R likelihood information

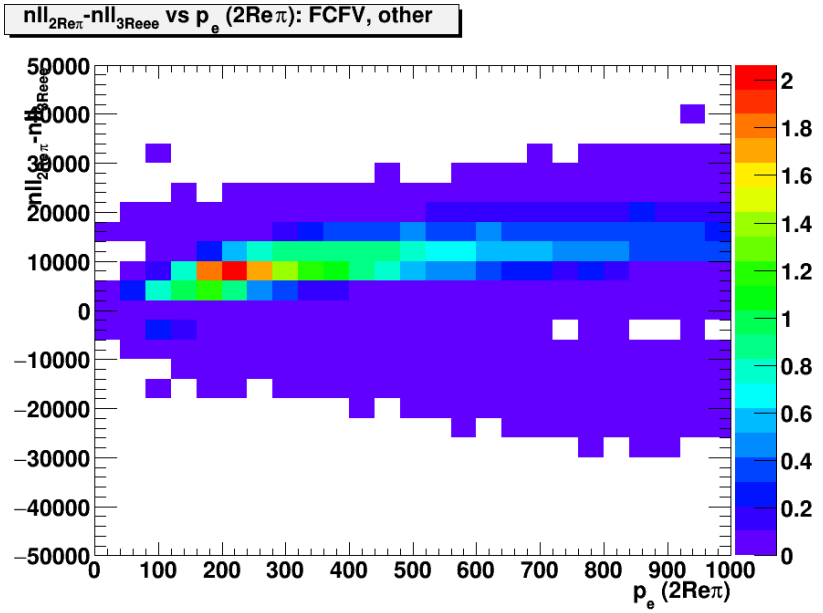
# What are 2-ring $\nu_e$ CC1$\pi$ events being reconstructed as?



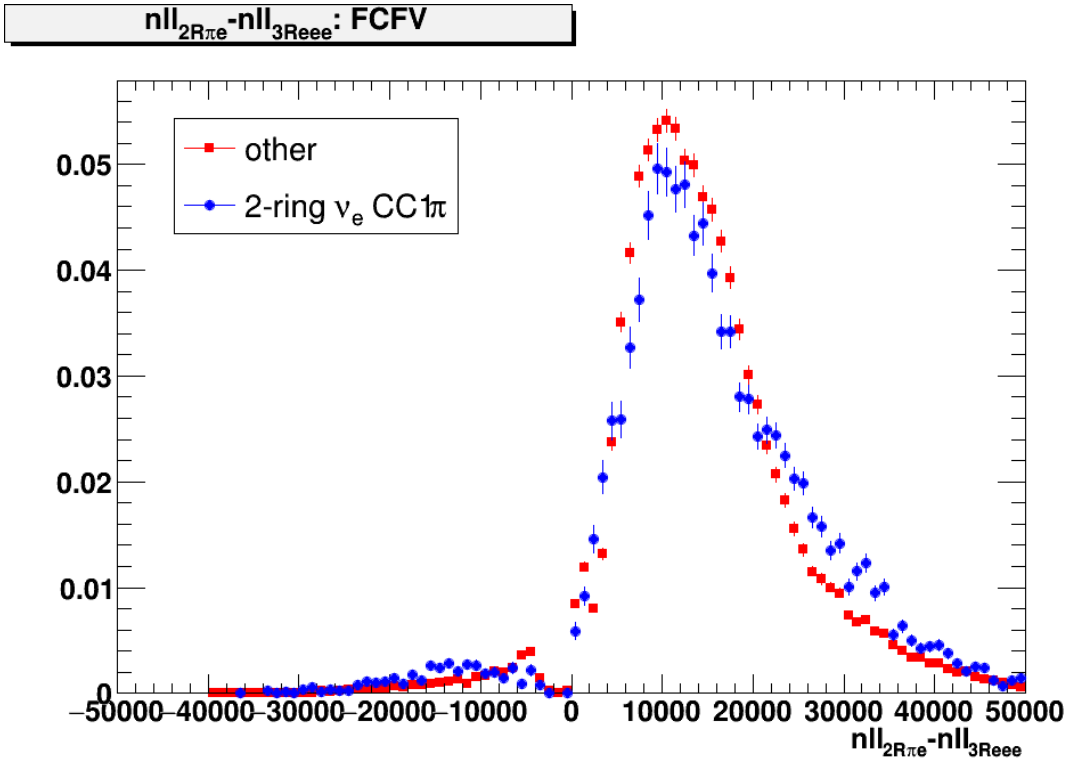
# 2Reπ vs 3Reee

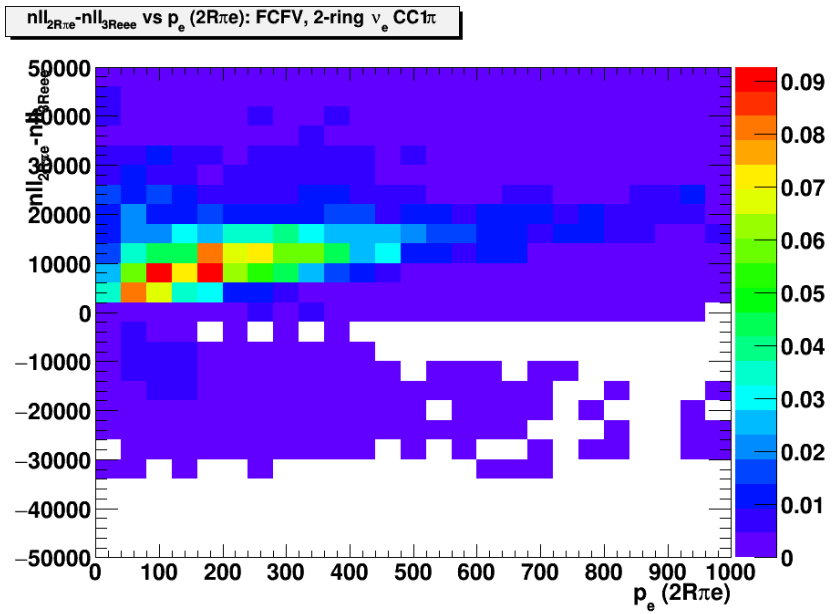


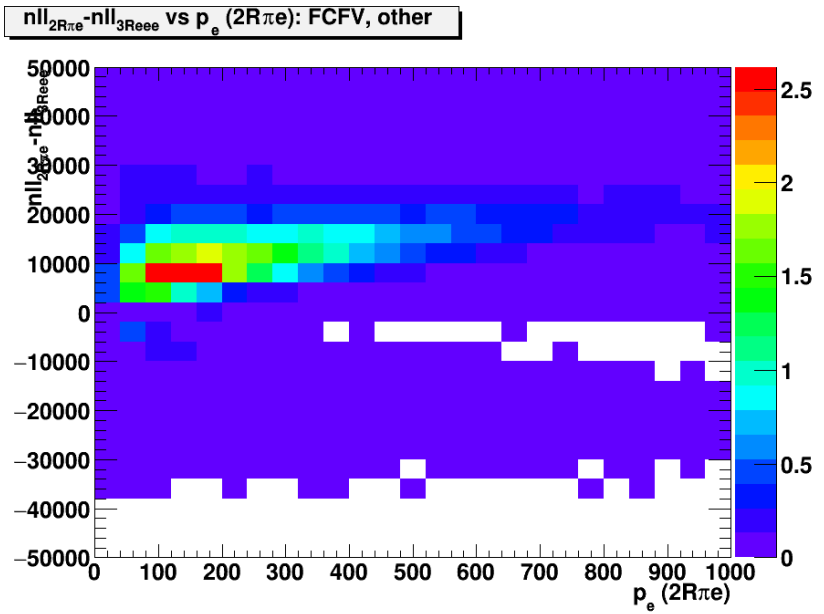



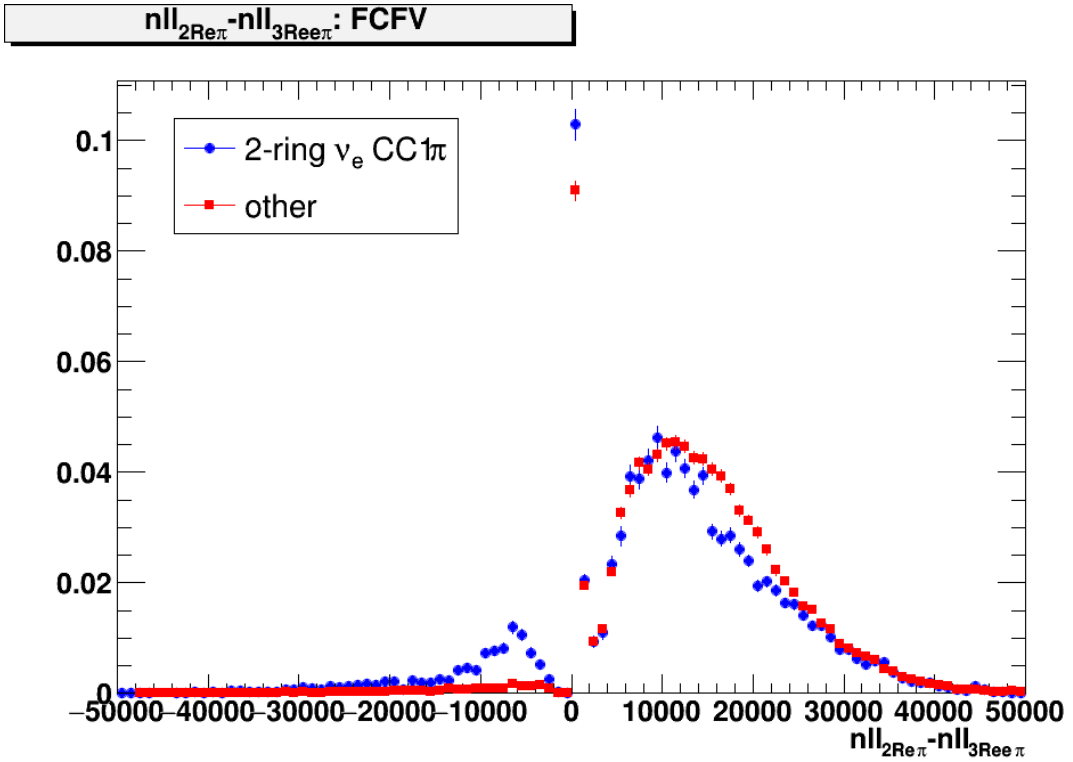
# 2Rπe vs 3Reee

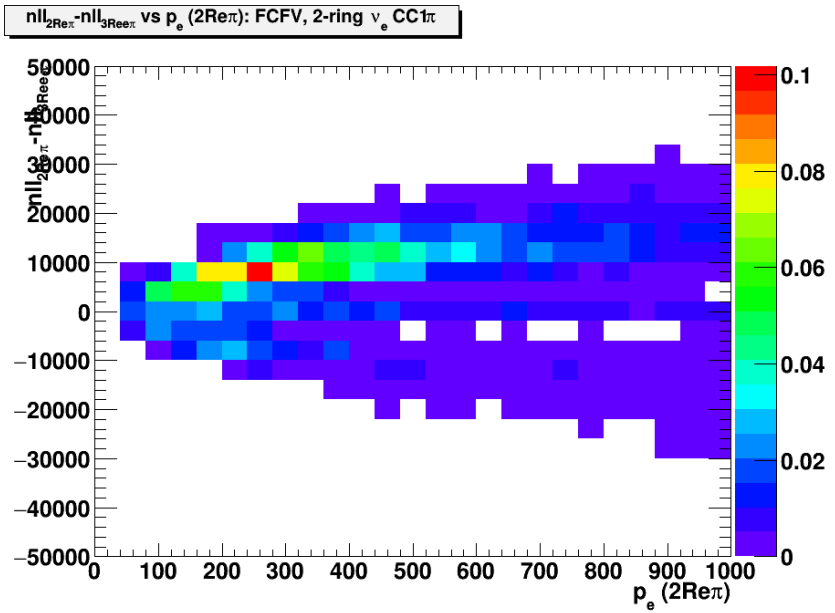


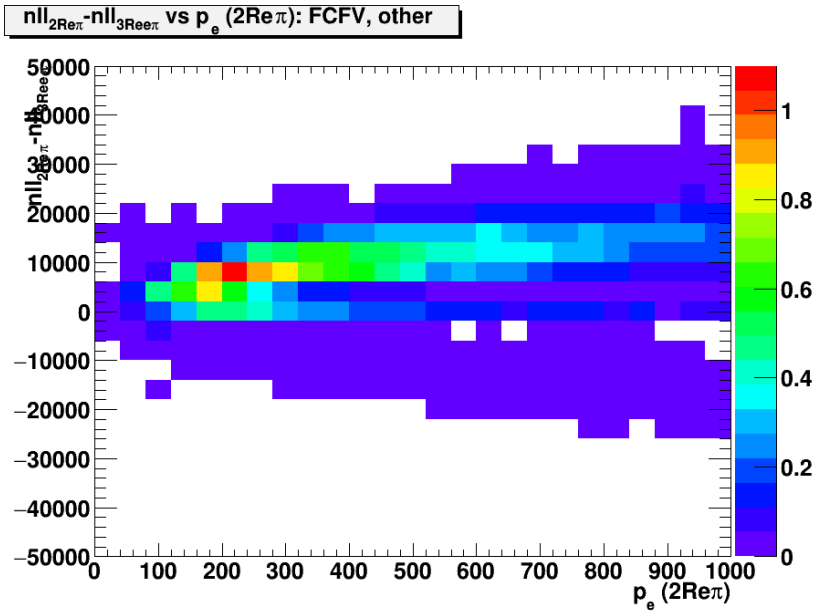



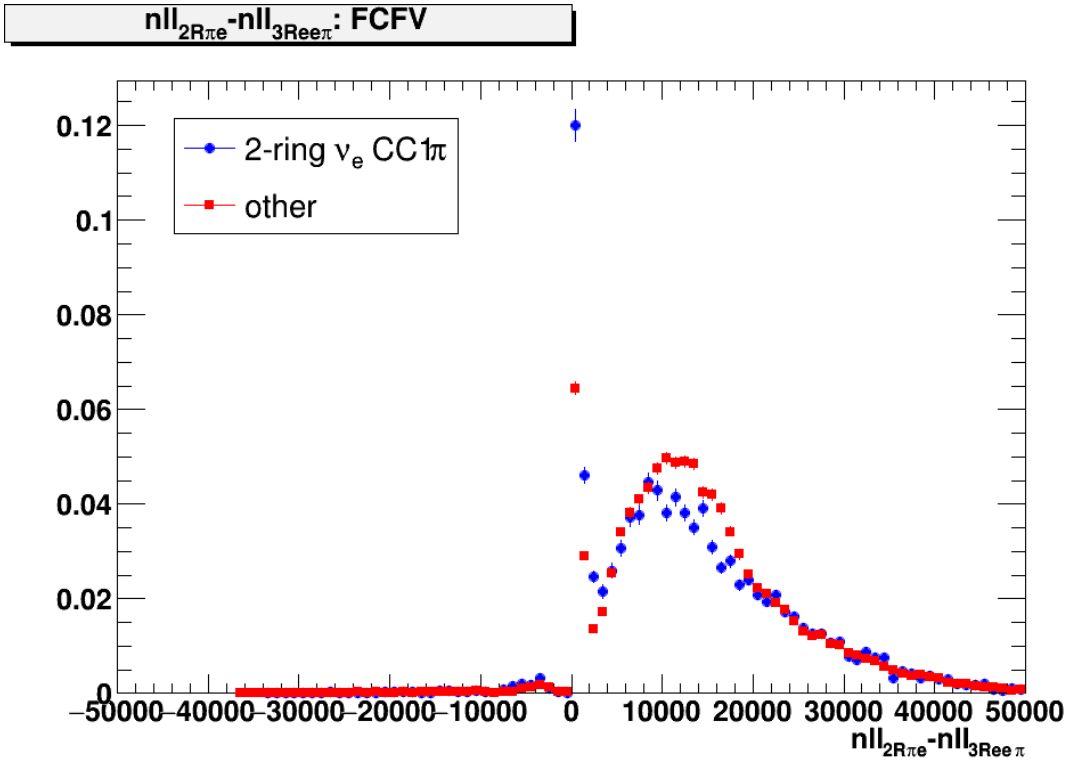
# 2Reπ vs 3Reeπ

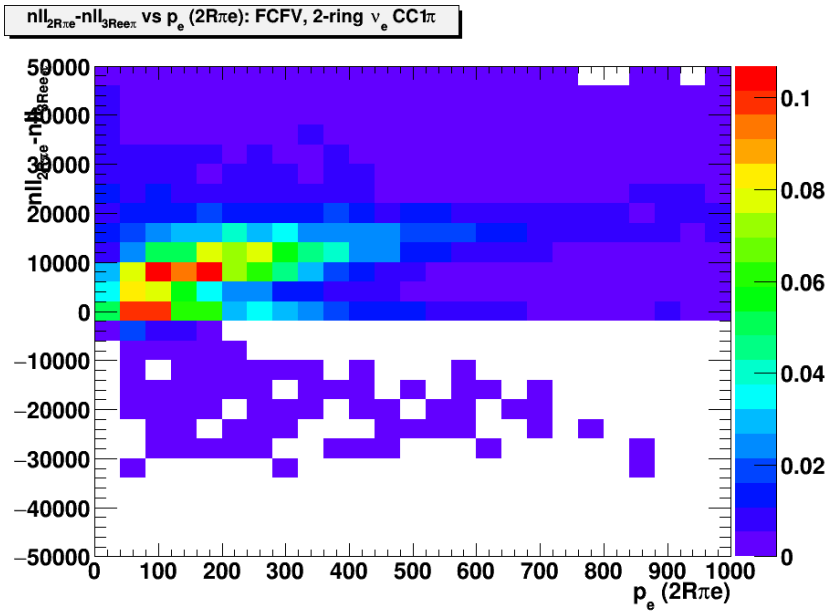


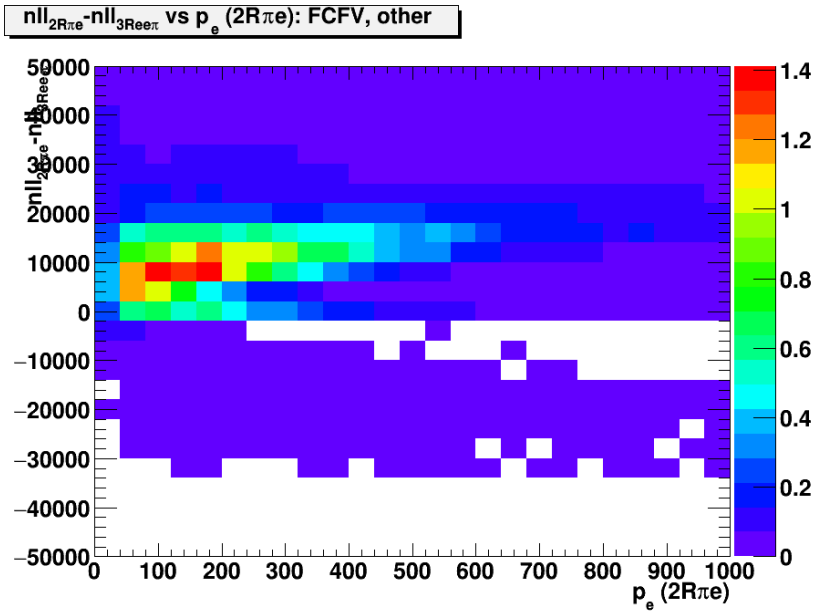



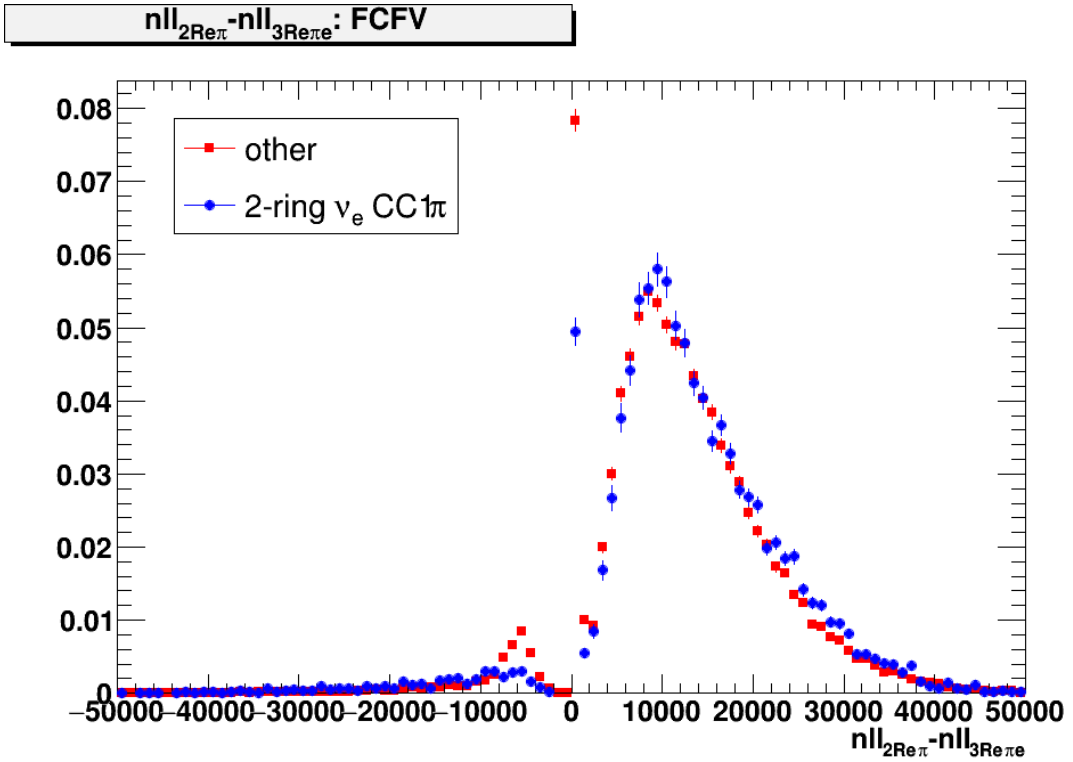
# 2Rπe vs 3Reeπ

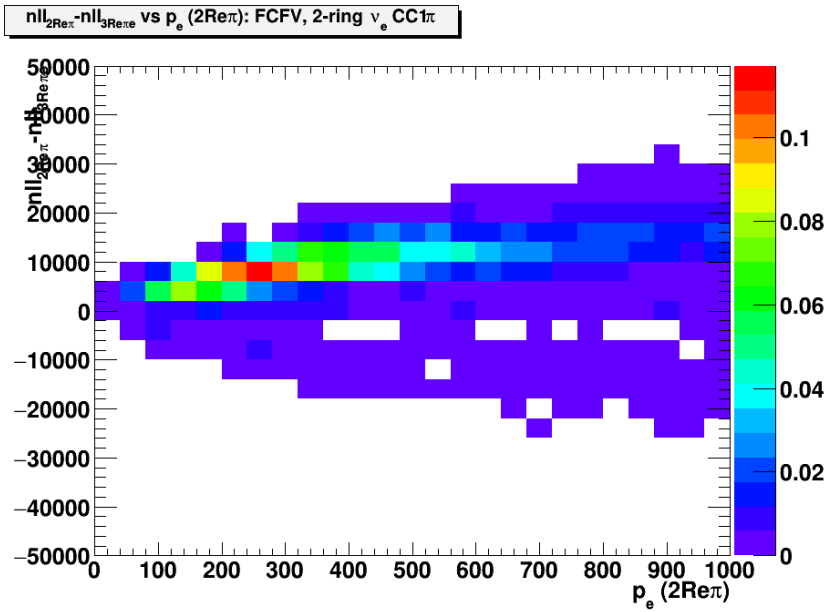


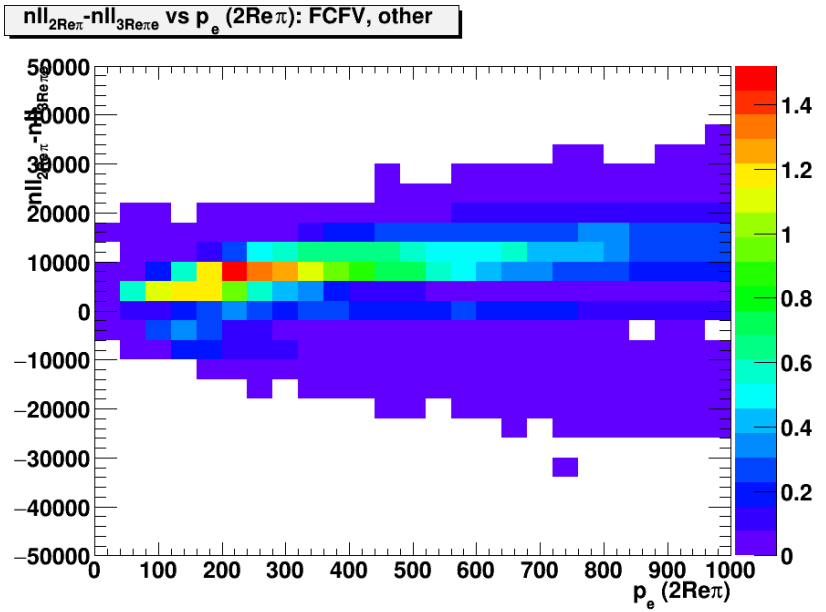



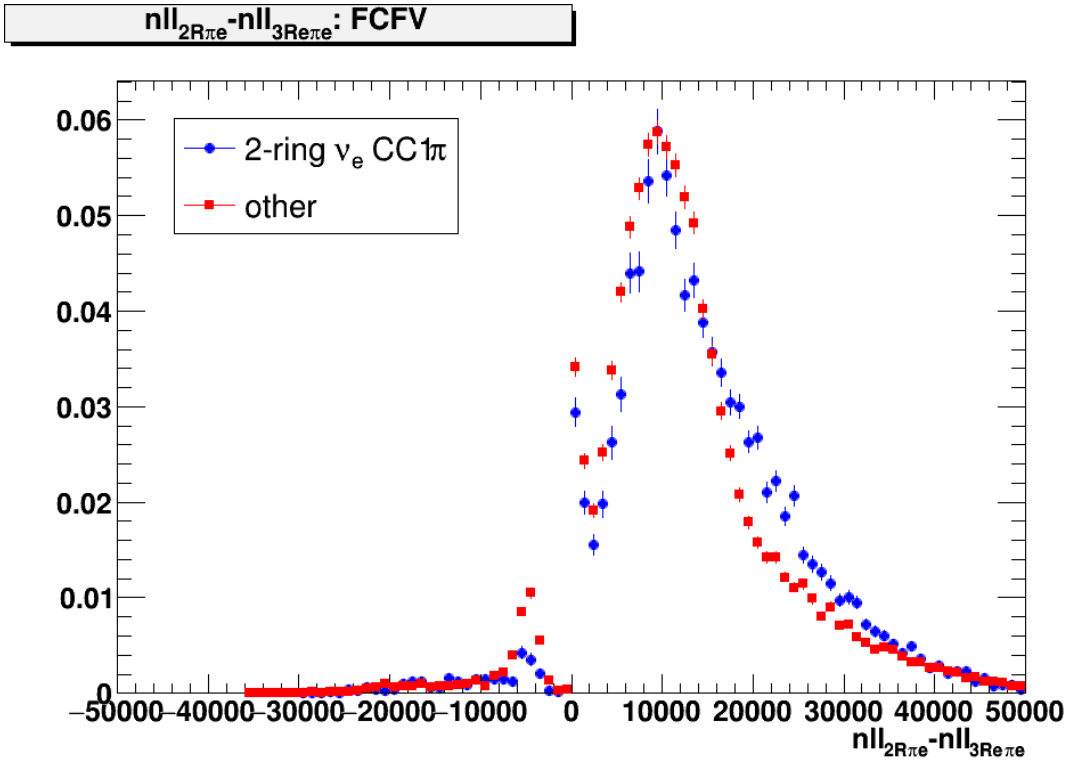
# 2Reπ vs 3Reπe

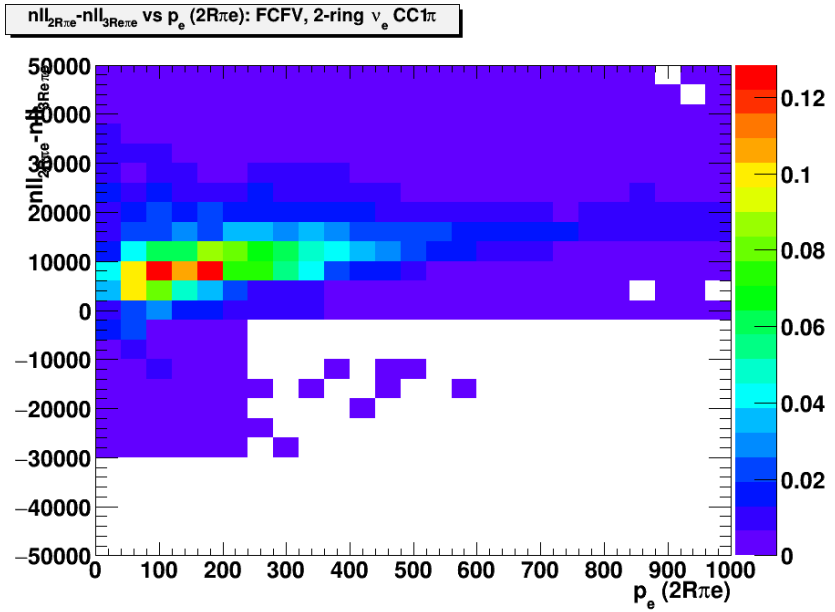


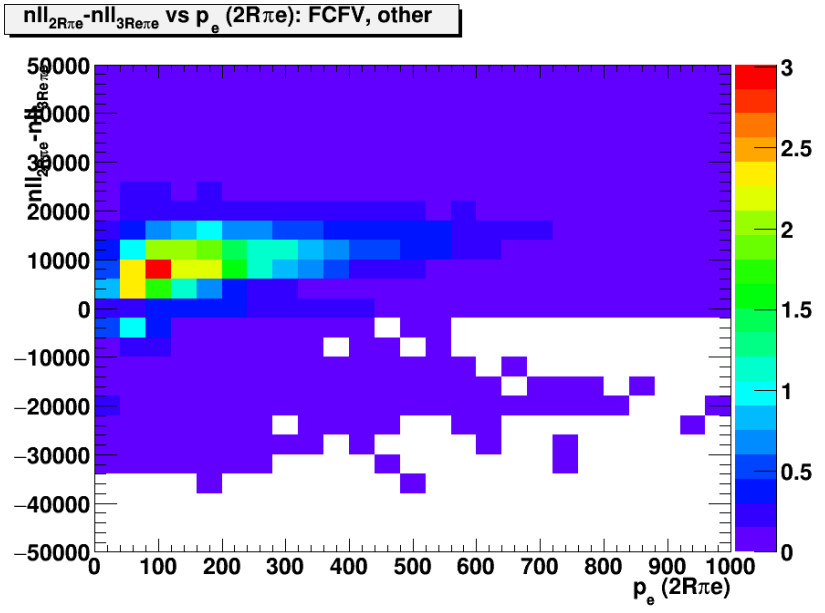



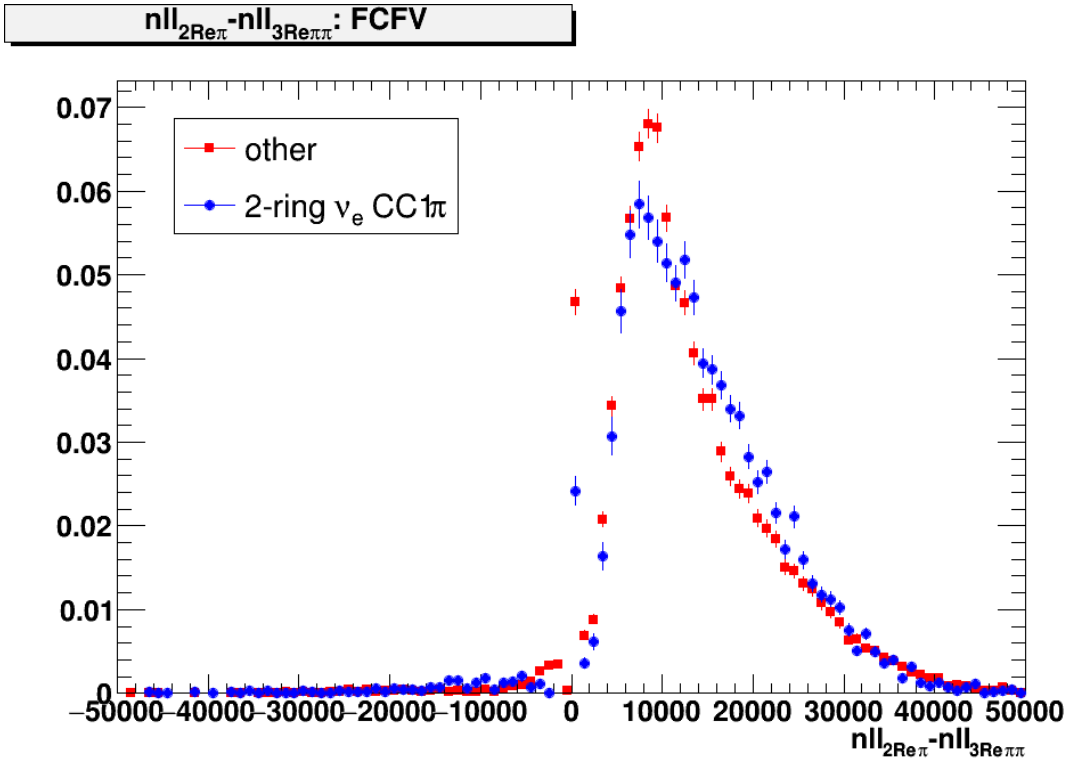
# 2Rπe vs 3Reπe

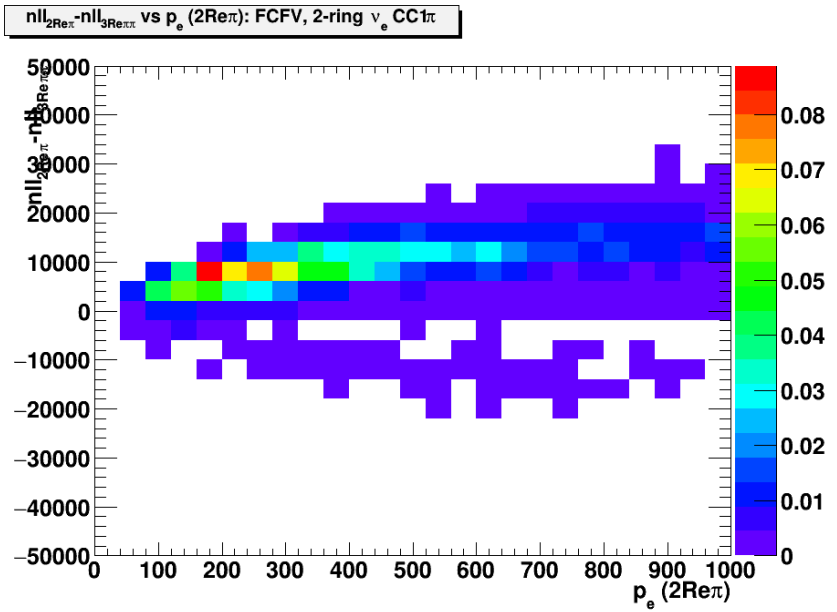


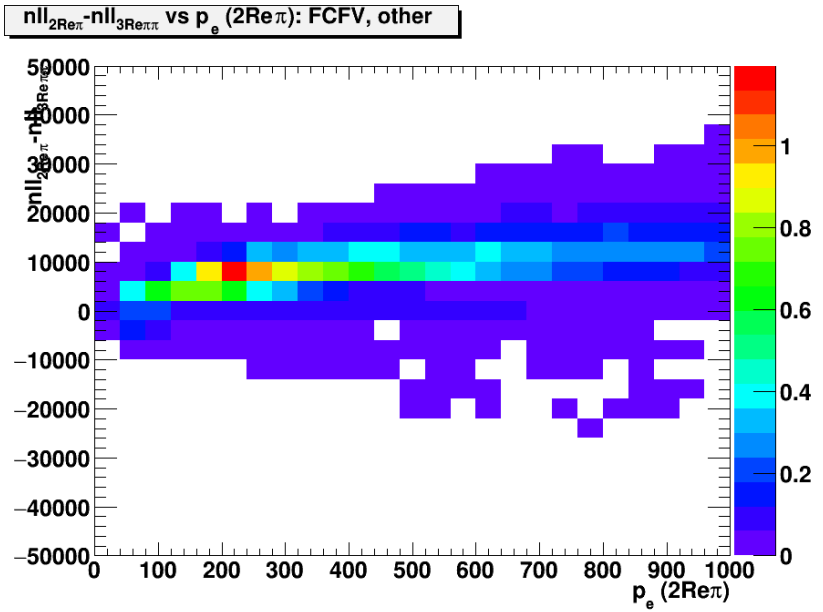



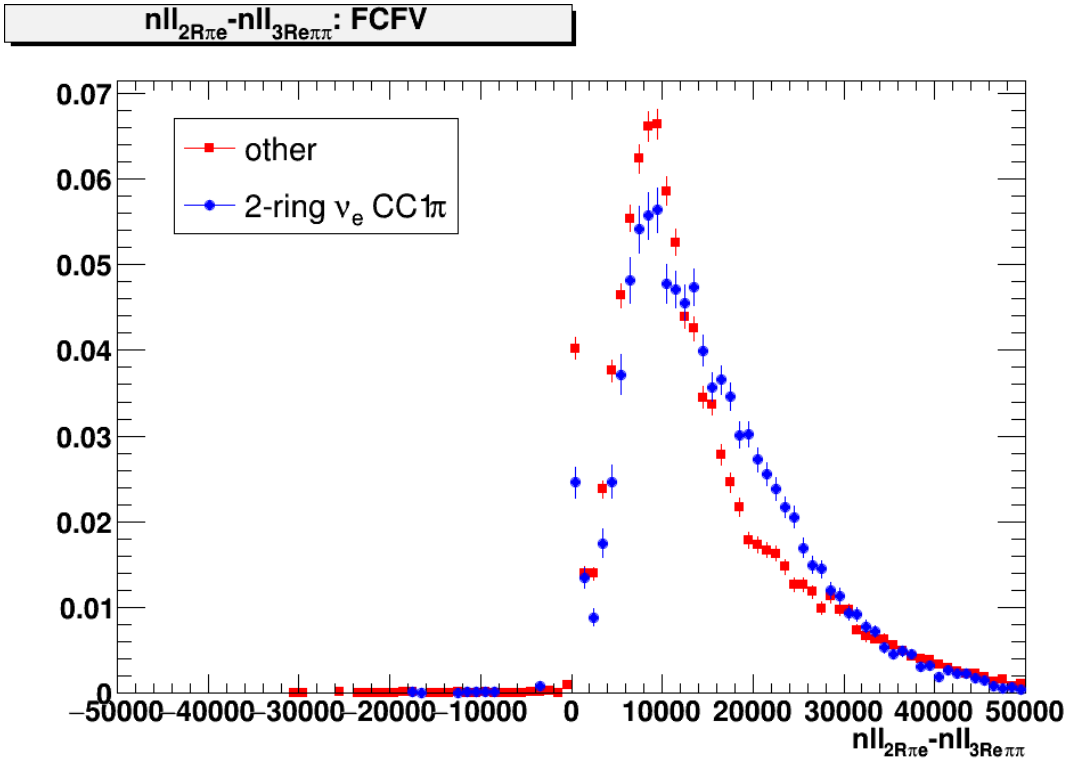
# 2Reπ vs 3Reππ

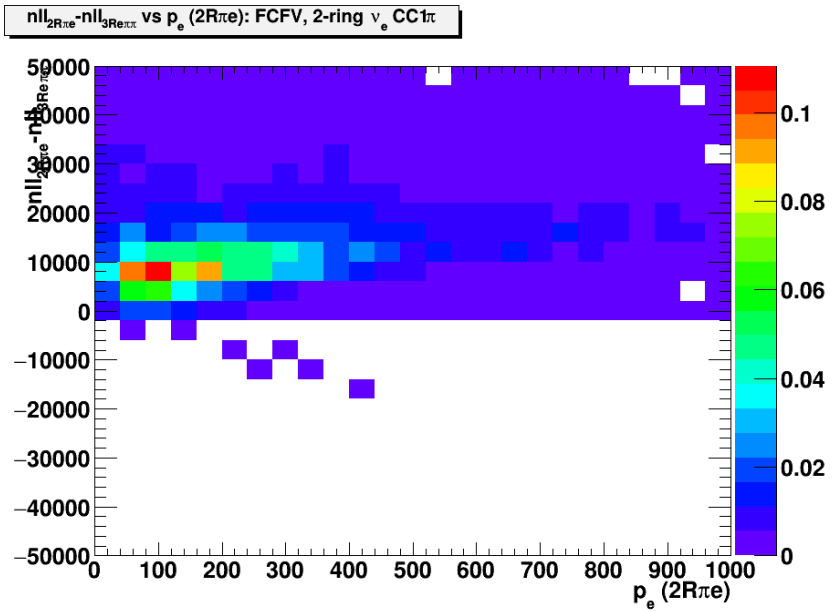


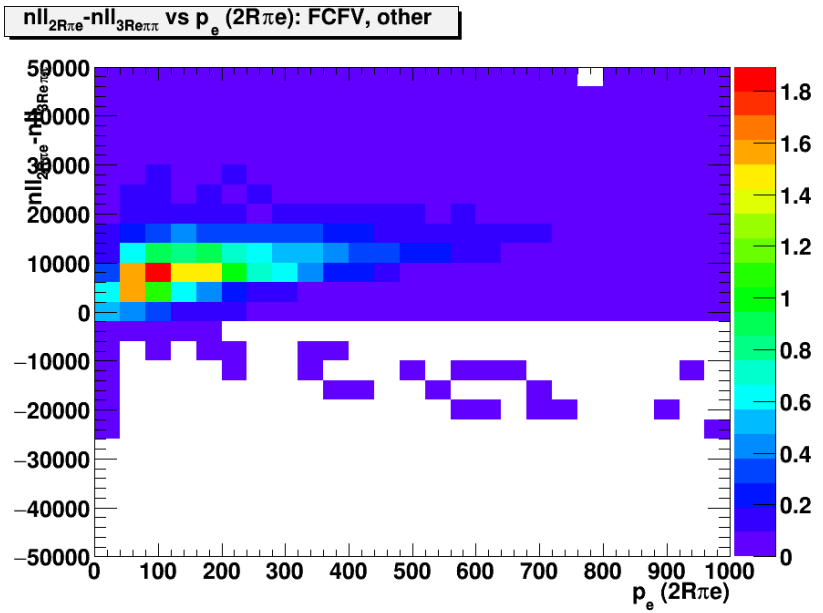



# 2Rπe vs 3Reππ



# Notes on new 2Reπ-like cut attempt

- Started by adding 2R-like events
  - 2Rμe-like events modestly improve efficiency, but when adding 2Rμe rejection efficiency improvement is lost (though purity improves)
  - 3Reee-like events improve efficiency significantly (particularly for 0de sample), but lots of $\nu_e$ CCother and CC1$\pi^0$ background
  - Other 3R reconstructed events improve efficiency modestly, but all struggle with backgrounds
    - 3Reππ is most pure
- Working now on more systematic approach to expanding selection