Preliminary Study of CC-Inclusive Events in the P0D and TPC (Update)

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Selection and Sample

• **Sample:**
  – MCP1 NEUT files (v7r21p1)
  – 3.2 E 20 POT
  – Beam Data: 1.08 E 19 POT (Middle Processing, v7r19p1)

• **Selection**
  – Require the track to have a **segment in the TPC** to be able to use their momentum info
  – Require P0D segment
  – Pick the highest momentum negatively charged track as the “muon”
  – Require reconstructed vertex in a P0D fiducial volume (in global coordinates):
    • X: -950 to 950
    • Y: -1090 to 1090
    • Z: -3224 to -1016

• **ECAL only Study**
  – Same cuts as above
  – Fiducial volume reduced to only the Central ECAL
  – Purpose: Compare with FGD and TPC study to first order
Data comparison agrees rather well after POT normalization for both cases.

Post-selection deficiency in lower energy region remains even in the ECAL only study, reasons?

P0D only CC-inclusive analysis may correct disagreement in momentum distribution.
Cos(Theta) Distributions

• Again, Data to MC agreement is rather good
Presented by Laura M. in Collaboration Meeting

They do not see a low energy deficiency (as compared to our ECAL only study)

Wider Cos Theta distribution compared to full POD study, but a little closer to the ECAL only distribution
Vertex Distributions

- Buildup of vertices downstream (as expected)
- Hot spot in XY-face
- Binned with 1 module per bin
Z Vertex Position

Vtx Pos(Z)

Entries 43604

Downstream
Next Steps

- Add more data
- Efficiency checks on P0D and TPC track matching
- Check reconstruction efficiencies
- Check alignment
- Hand scan events to find gross problems
- Introduce a track quality cut
- Checks of dE/dX correction in P0D