sPHENIX D_s Meson Simulation Studies

sPHENIX HF Topical Group Meeting

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05/17/2021

Overview of Truth Tagging on D_s with KF Particle Package

- Rerun the D_s reconstruction from KKπ from MDC part of (fraction = 1/9) c cbar sample using the **latest** KF Particle package developed by Cameron on the sPHENIX software **ana.241**

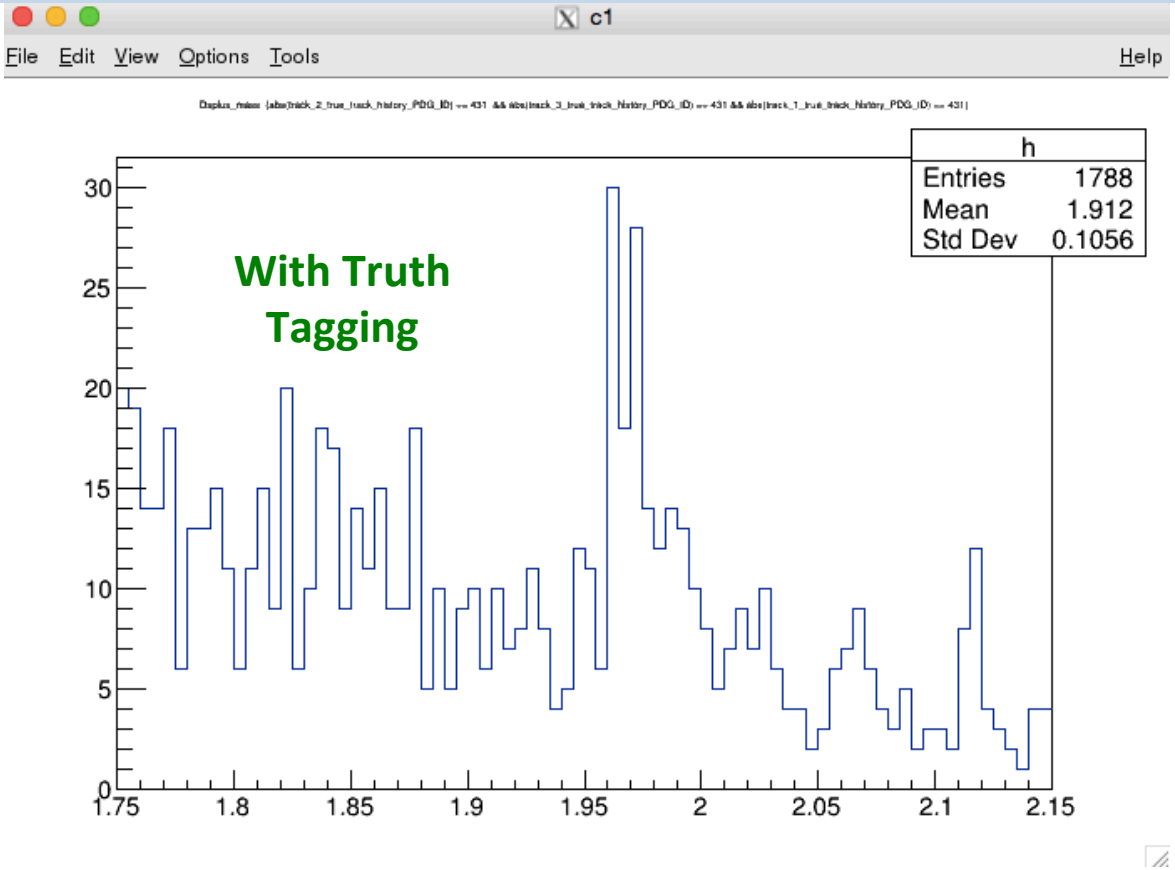
- Need to rebuild some additional packages like DecayFinder and link to the KF particle codes properly

- Apply additional truth tagging on D_s to the KKπ candidates and see how it looks like

- Technically, from my understanding, to ensure the track is truth tagged from D_s, I just apply: abs(track_*_true_track_history_PDG_ID) == 431 (D_s PDG ID)

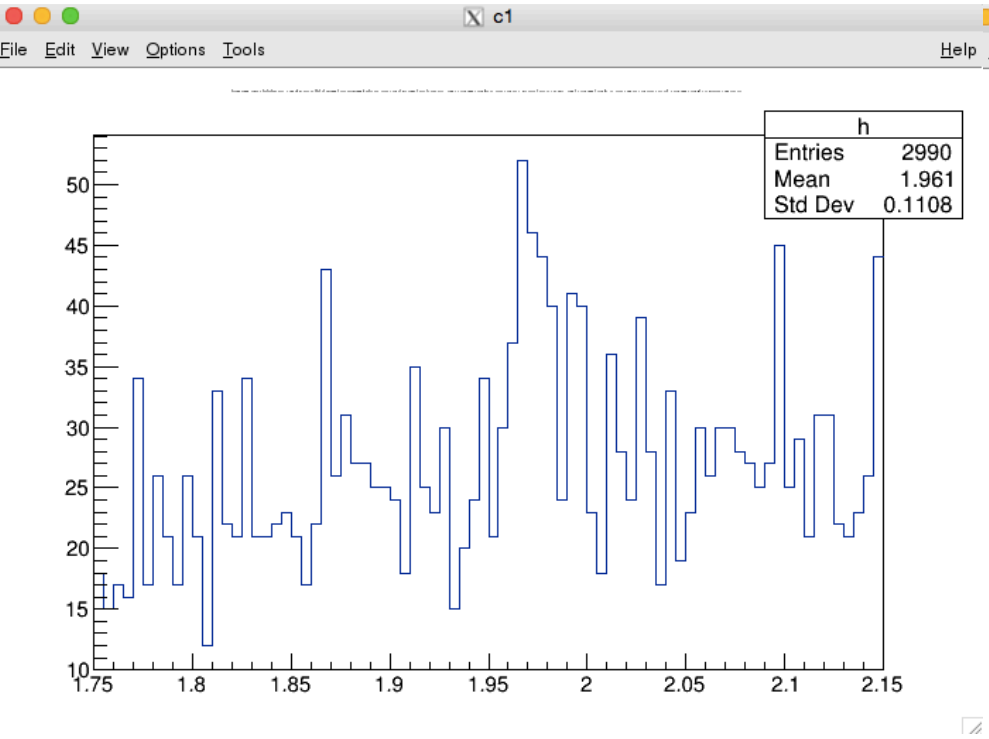
- The goal is to validate the machinery and will use it for more difficult resonance search such as B^+ and B_s

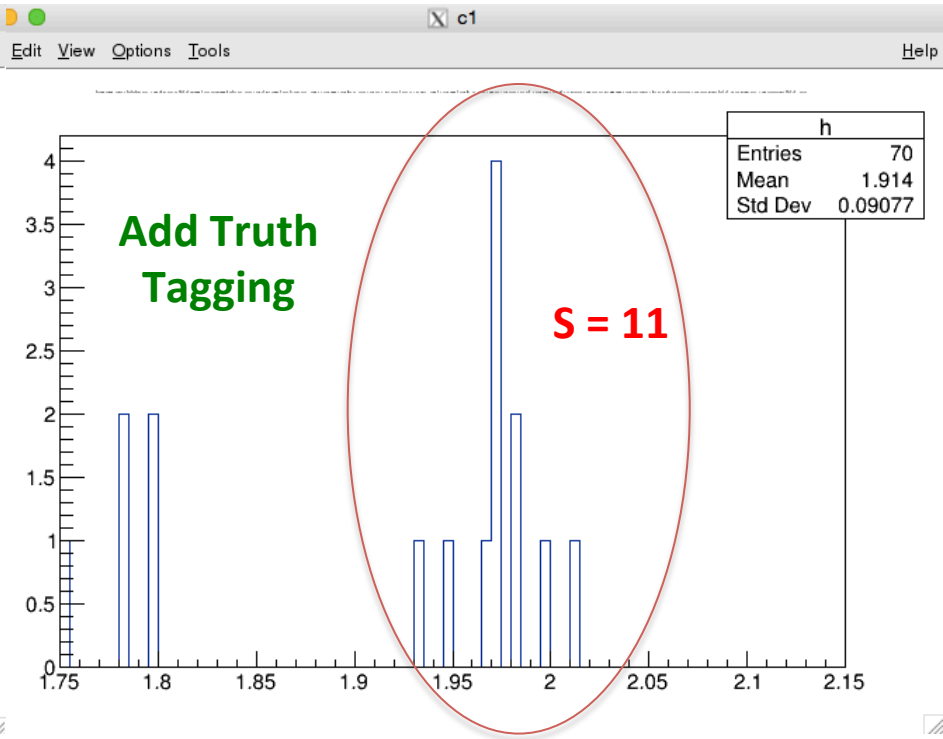
D_s -> KKπ without and with Truth Tagging (No Cut)



- After truth tagging, we can see a nice D_s peak with the D^+ resonance gone
- There are still background due to the reconstruction without PID -> wrong assignment of mass to the π and K tracks

D_s -> KKπ without and with Truth Tagging (D_s Cut)





- After truth tagging, we can see a nice D_s peak with all types of the backgrounds including the D^+ resonance gone
- We estimate the D_s S/B candidates ratio to be about 70/2990 = 2.34% in the c cbar sample after our previous analysis cuts