Difference in H3L acceptance between two data of the same energy using different Star Library

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Dataset and event selections

- Run 2020 FXT Au+Au 5.2 GeV
    - production_13p5GeV_fixedTarget_2020（P21id and P23ie)
- Trigger: 750000（epde-or-bbce-or-vpde-tof1)
- Badrun:21034002,21034007
  https://drupal.star.bnl.gov/STAR/pwg/common/bes-ii-run-qa/FXT-datasets
- Vertex cuts:

198 < Vz < 202 cm,

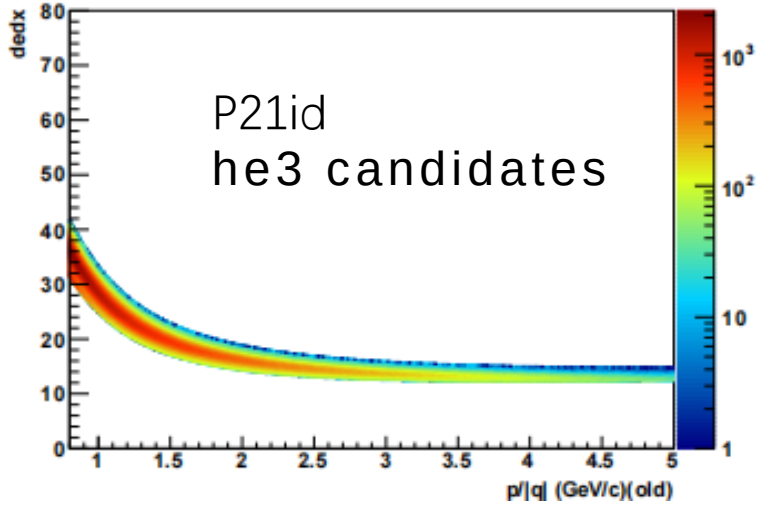
$$\sqrt{(Vx+0.3)*(Vx+0.3)+(Vy+2)*(Vy+2)} < 2$$

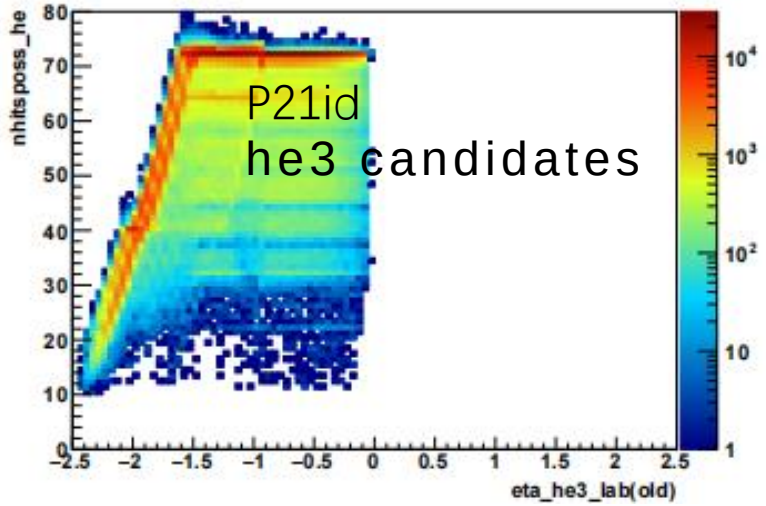
- No Centrality definition& pileup rejection
- Basic track cuts:
  ⇨nHitsFit>10
  ~~⇨nHitsFit/nHitsMax ⩾ 0.52~~ ✖
  ⇨ Pt>0.8GeV/c

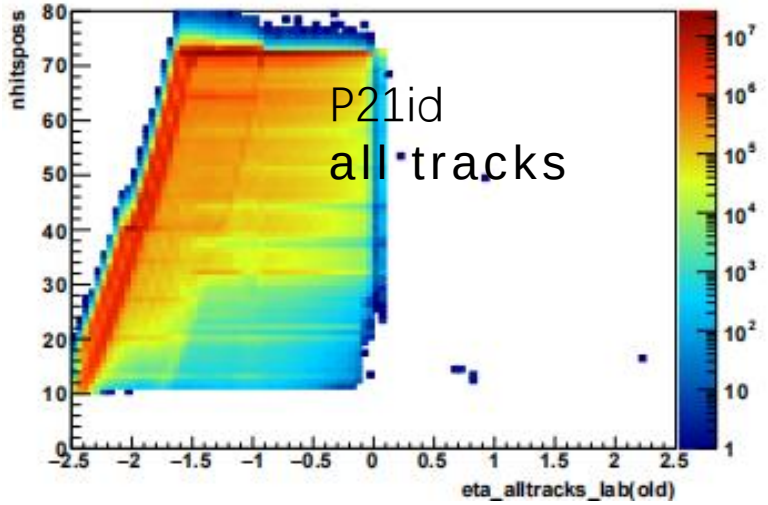
Data of different Star Library using the same event cuts and track cuts

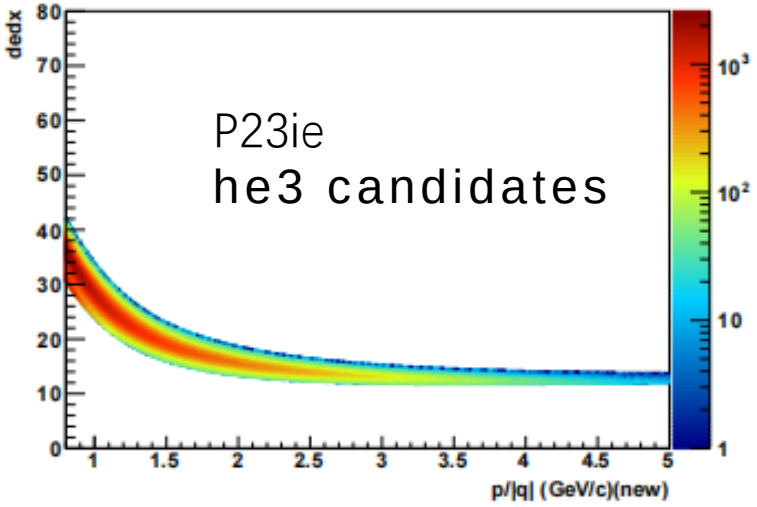
- He3 candidates
  ⇨Using TPC information
  Using m2 range cut,we get dedx vs p/|q|;cut p/|q| into many pieces and project them into the y-axis dedx then we use gaussian function to fit them and we get the mean and σ(mean ±3σ are the bands)
- events: ~108M events for P23ie ~79M events for P21id

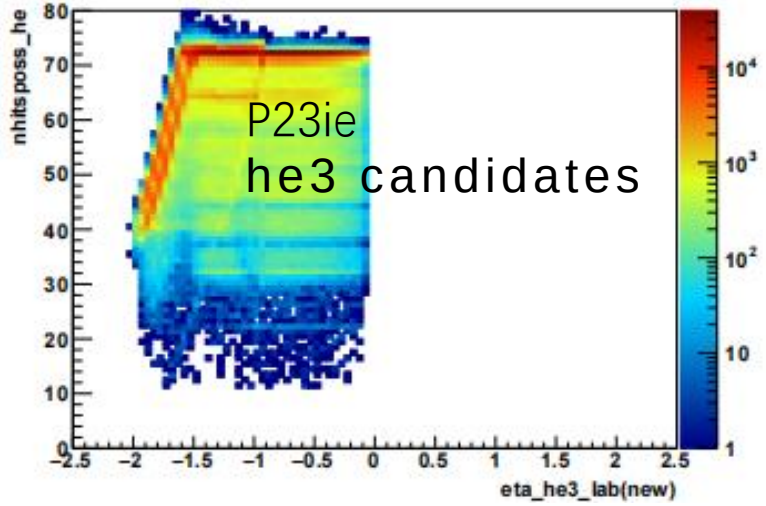
nhitsposs vs eta of he3 (he3 candidates pass ±3σ dedx bands or all tracks)

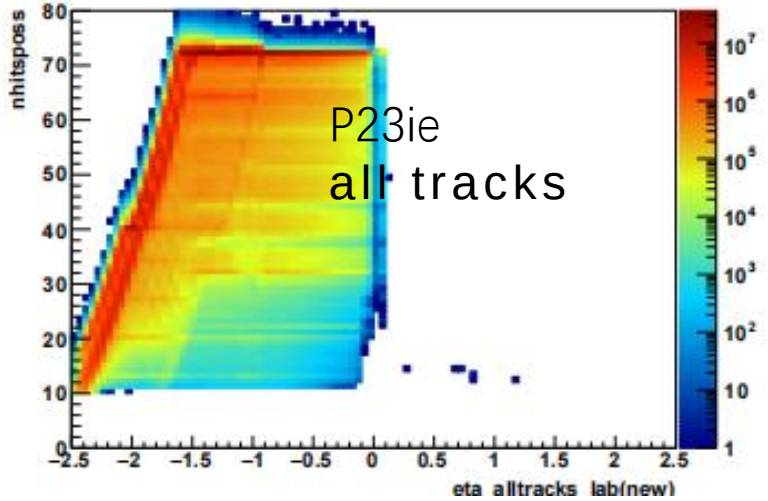




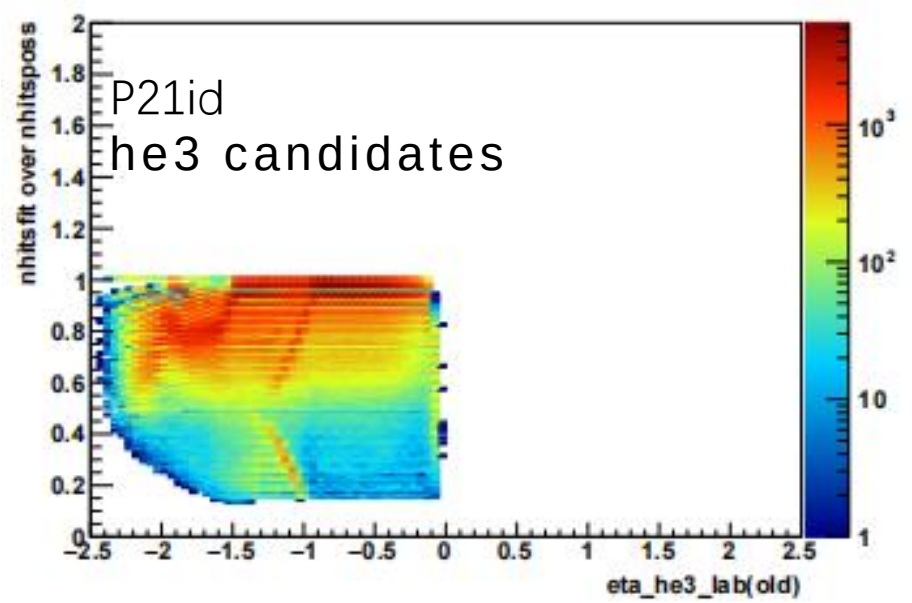


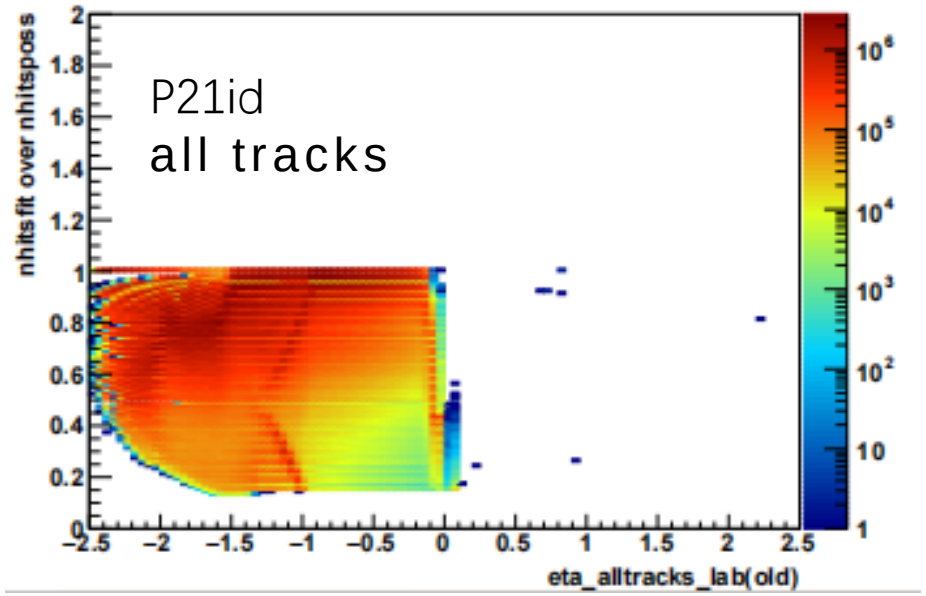


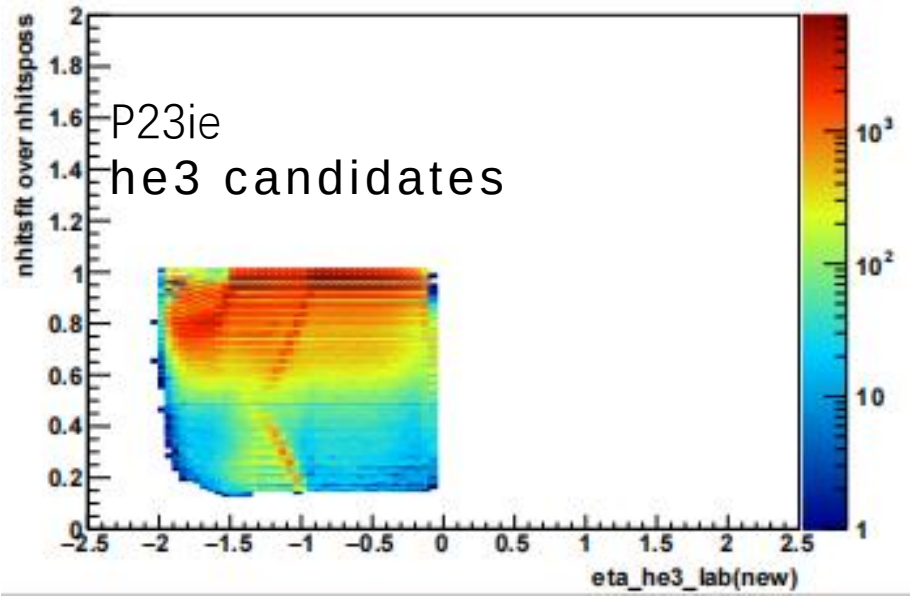


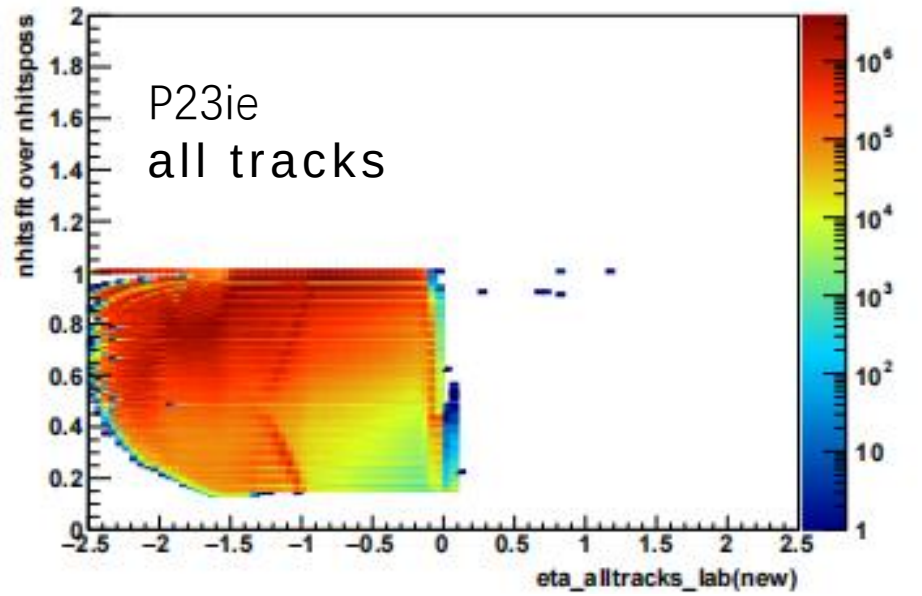


nhitsfitovernhitsposs vs eta of he3 (he3 candidates pass ±3σ dedx bands or all tracks)

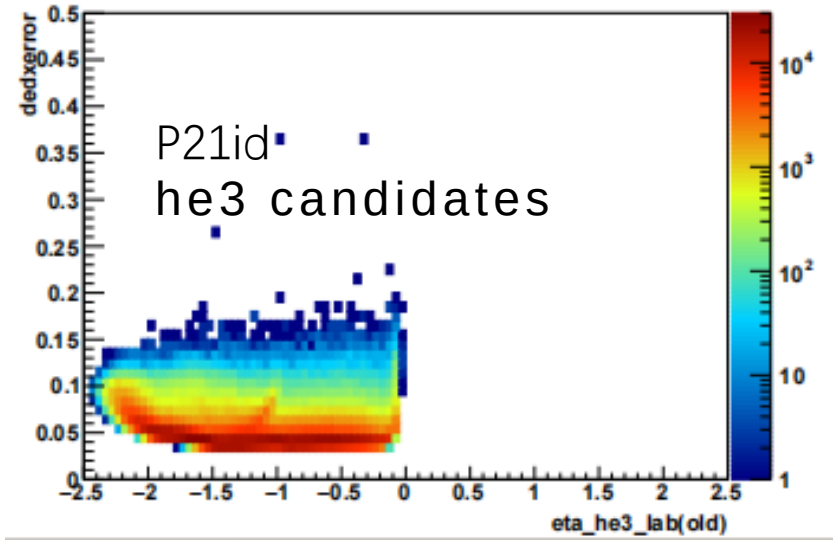


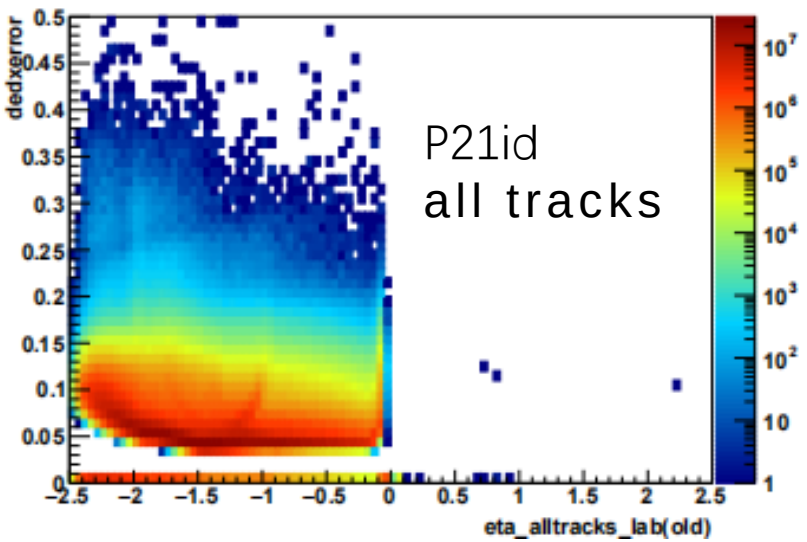


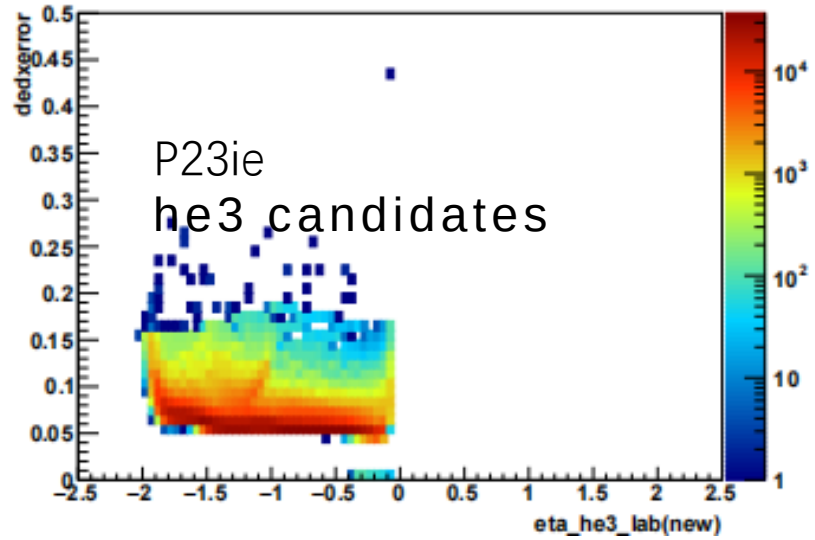


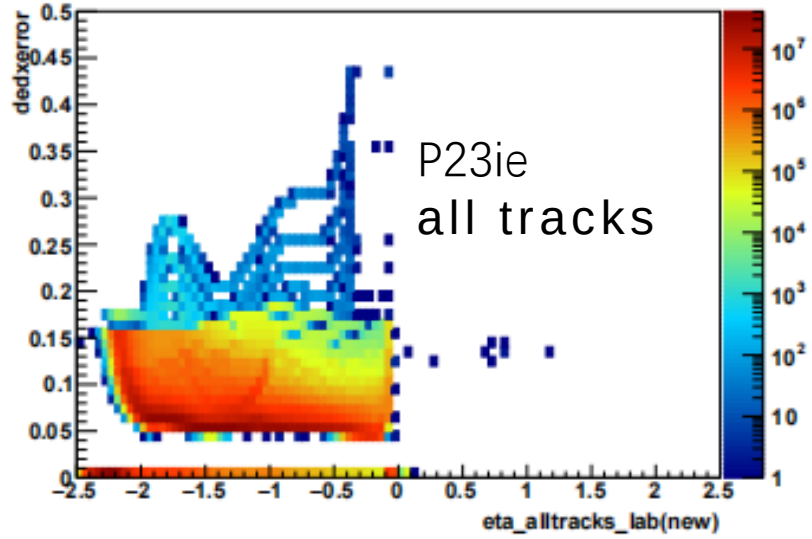


dedxerror vs eta of he3 (he3 candidates pass ±3σ dedx bands or all tracks)

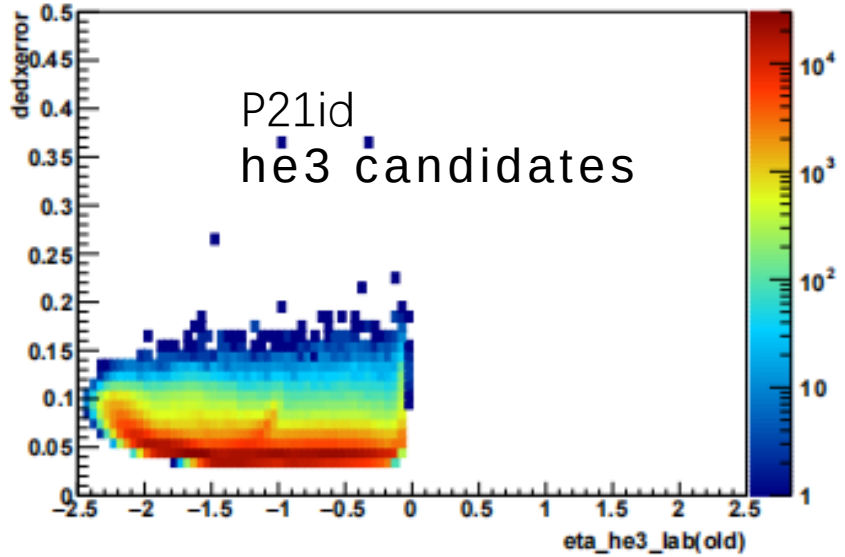


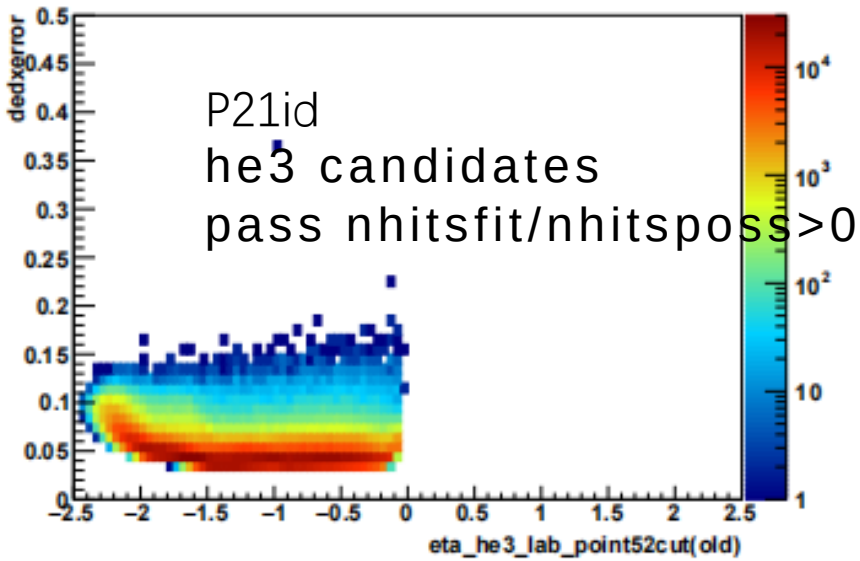


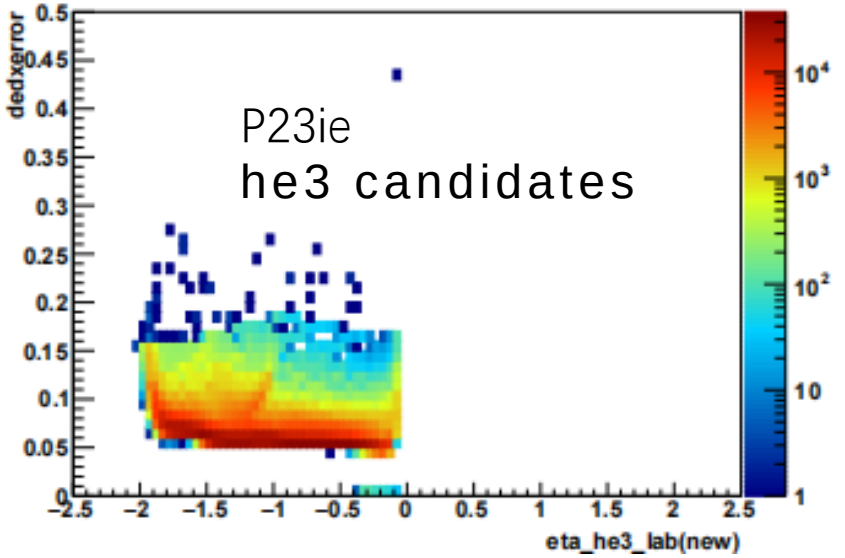


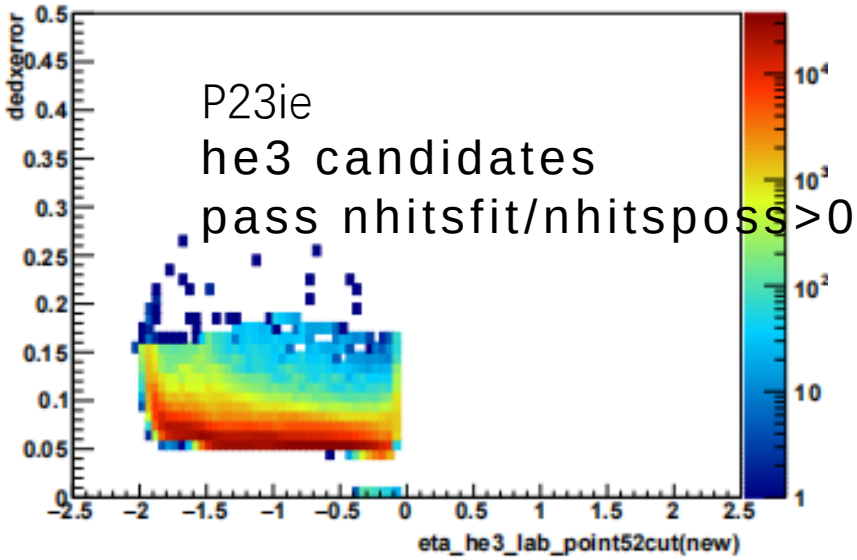


dedxerror vs eta of he3 (he3 candidates pass ±3σ dedx bands)

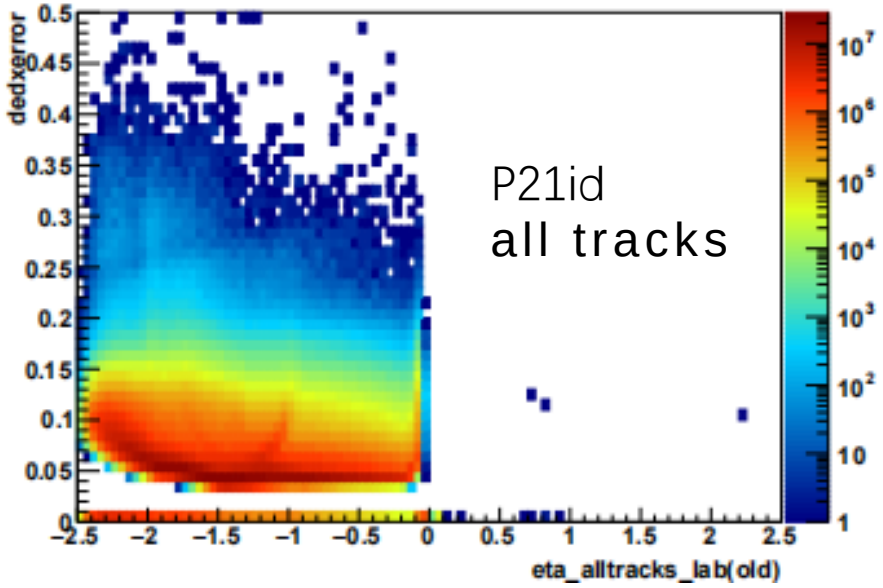


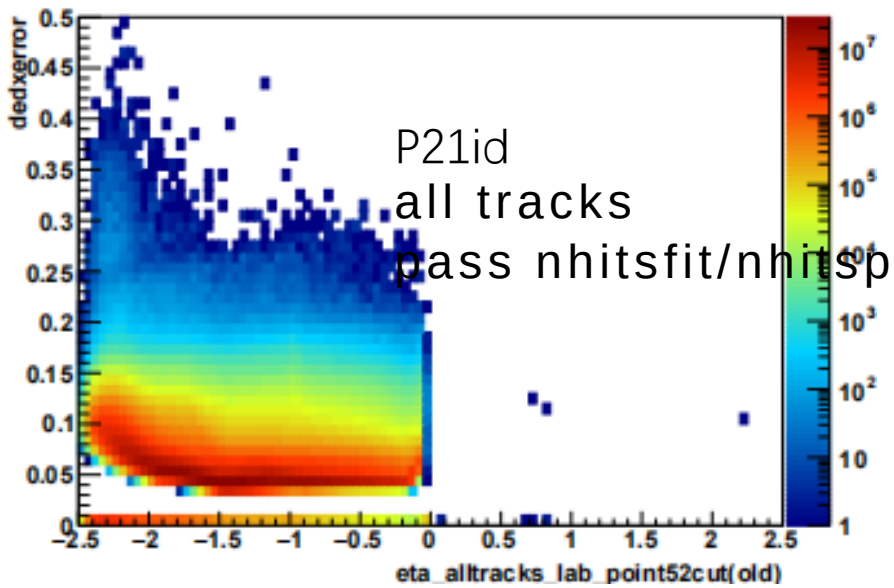


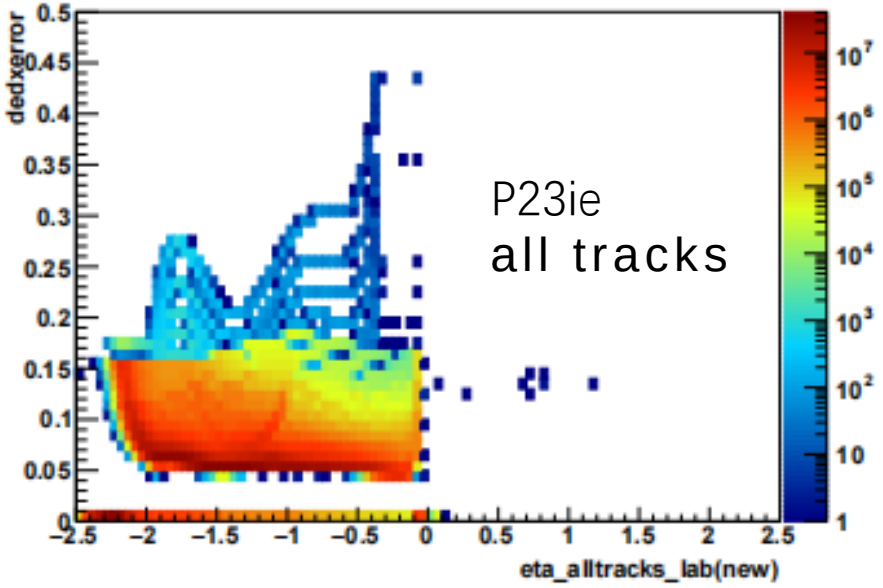


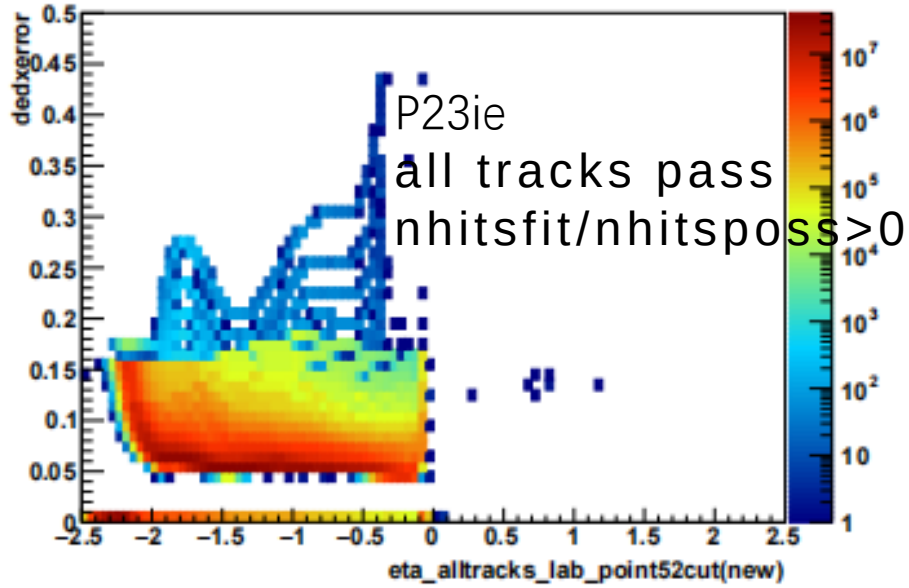


dedxerror vs eta of all tracks

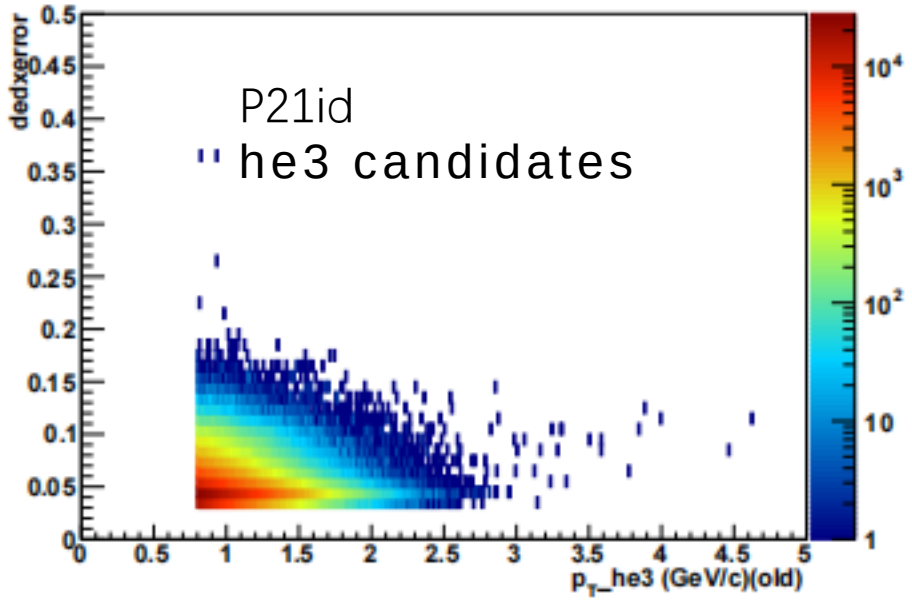


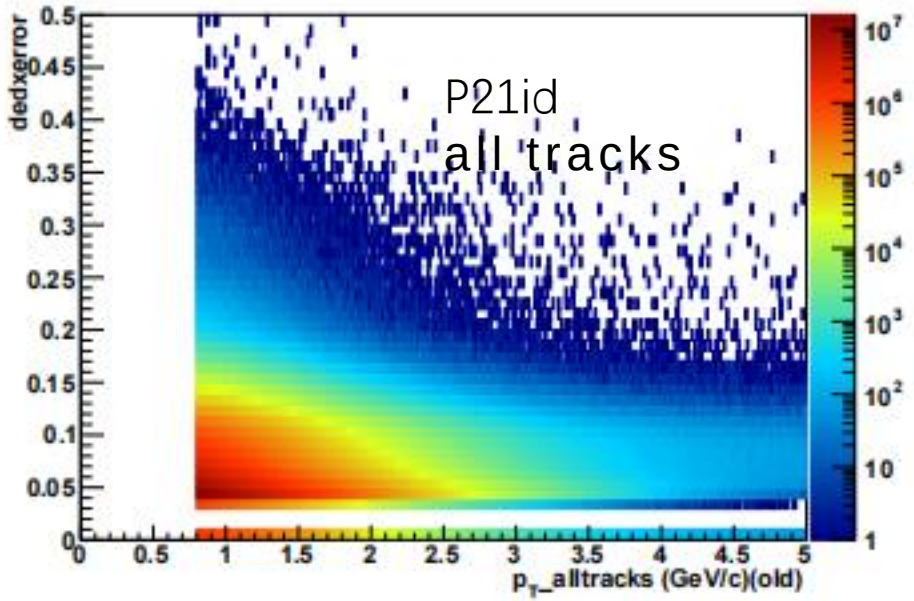


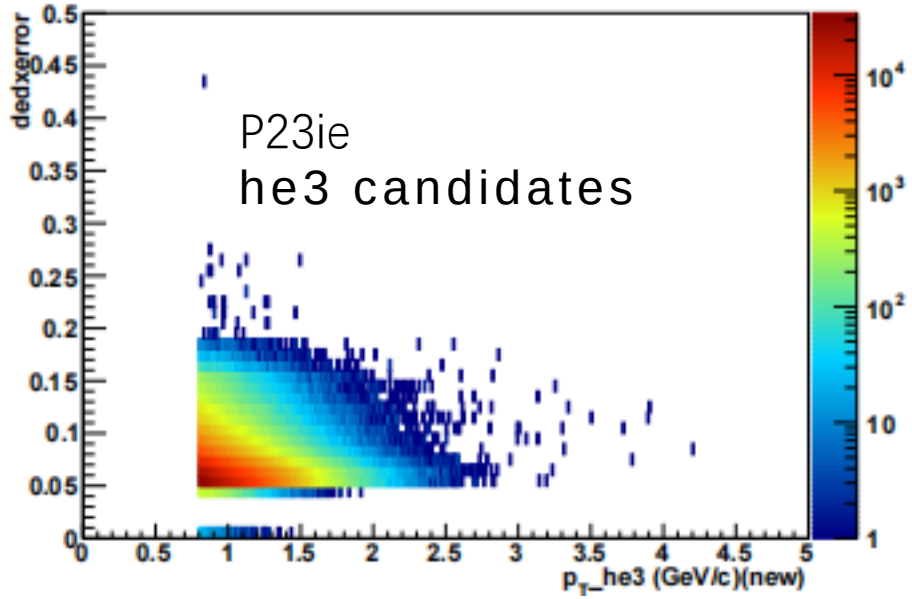


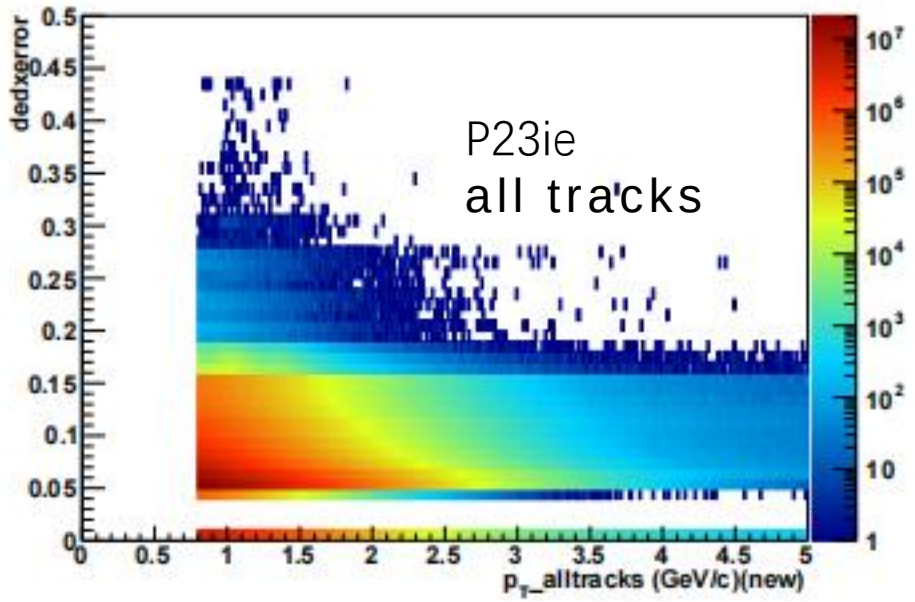


dedxerror vs Pt of he3 (he3 candidates pass ±3σ dedx bands or all tracks)









Summary

From the above slides,this cut (nhitsfit/nhitsposs>0.52) has no effect on what we have seen before(He3 disappears where eta<-2)

dedx vs p/|q| of all tracks and he3 (eta <-2)