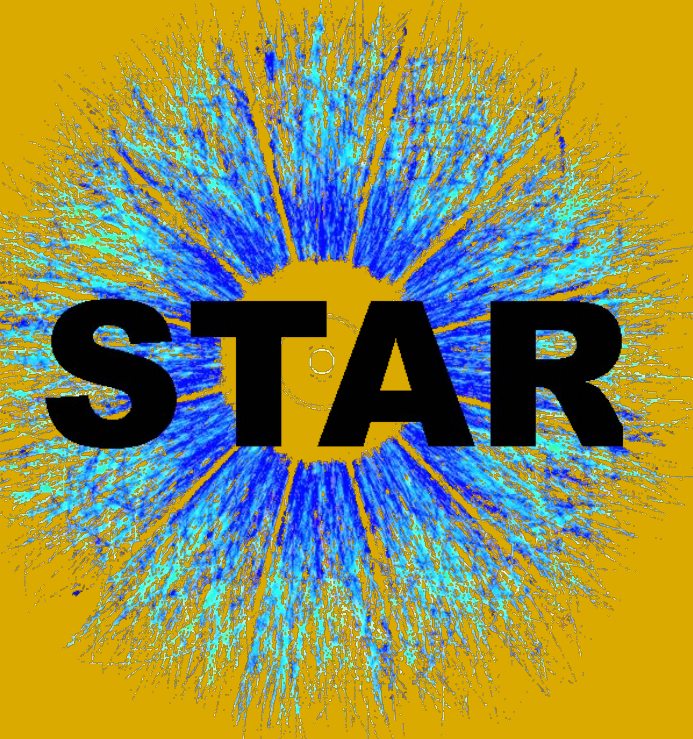




STAR Run 19 Quality Assurance

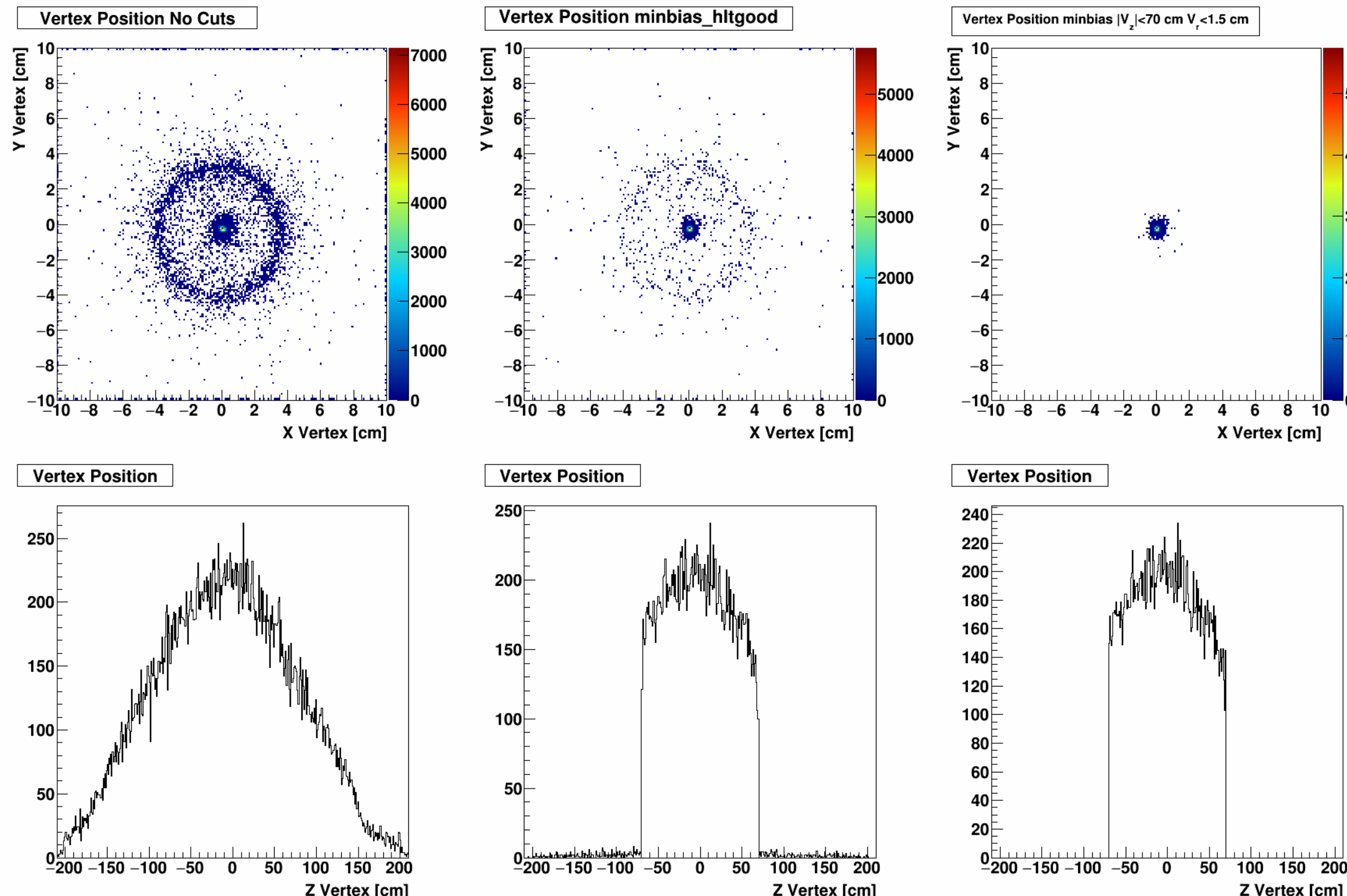
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Online QA

Shift crew monitors various QA plots for any issues that occur during a run. This allow us to make changes to triggers and the detector in real time, as well as to communicate with MCR regarding beam optimization.

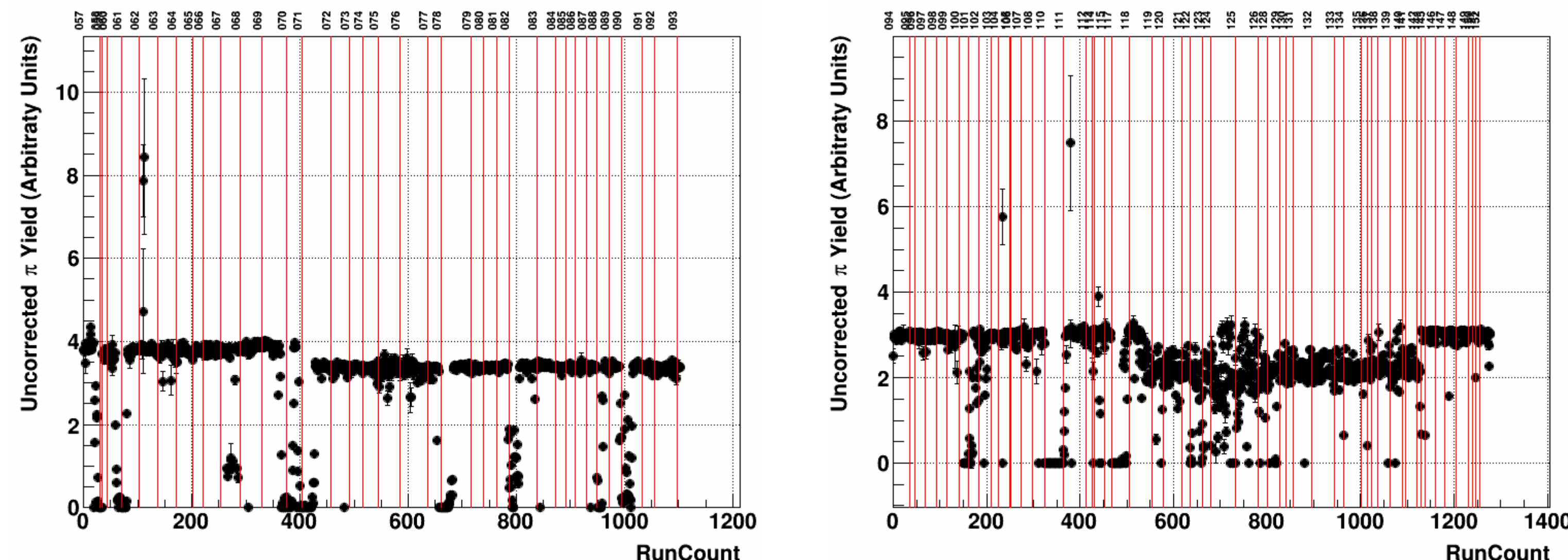
High Level Trigger (HLT)



Comparison of primary vertex position of offline reconstruction for all minimum bias events (left column), minimum bias events defined online as good by the HLT (middle column), and minimum bias events with offline vertex selection cuts applied (right column). The offline vertex selection cuts require that $|V_z| < 70$ cm, $V_r < 1.5$ cm, and number of tracks matched to barrel time of flight hits ≥ 3 .

96% of vertices identified as good by the HLT are also identified as good from offline analysis.

Offline QA



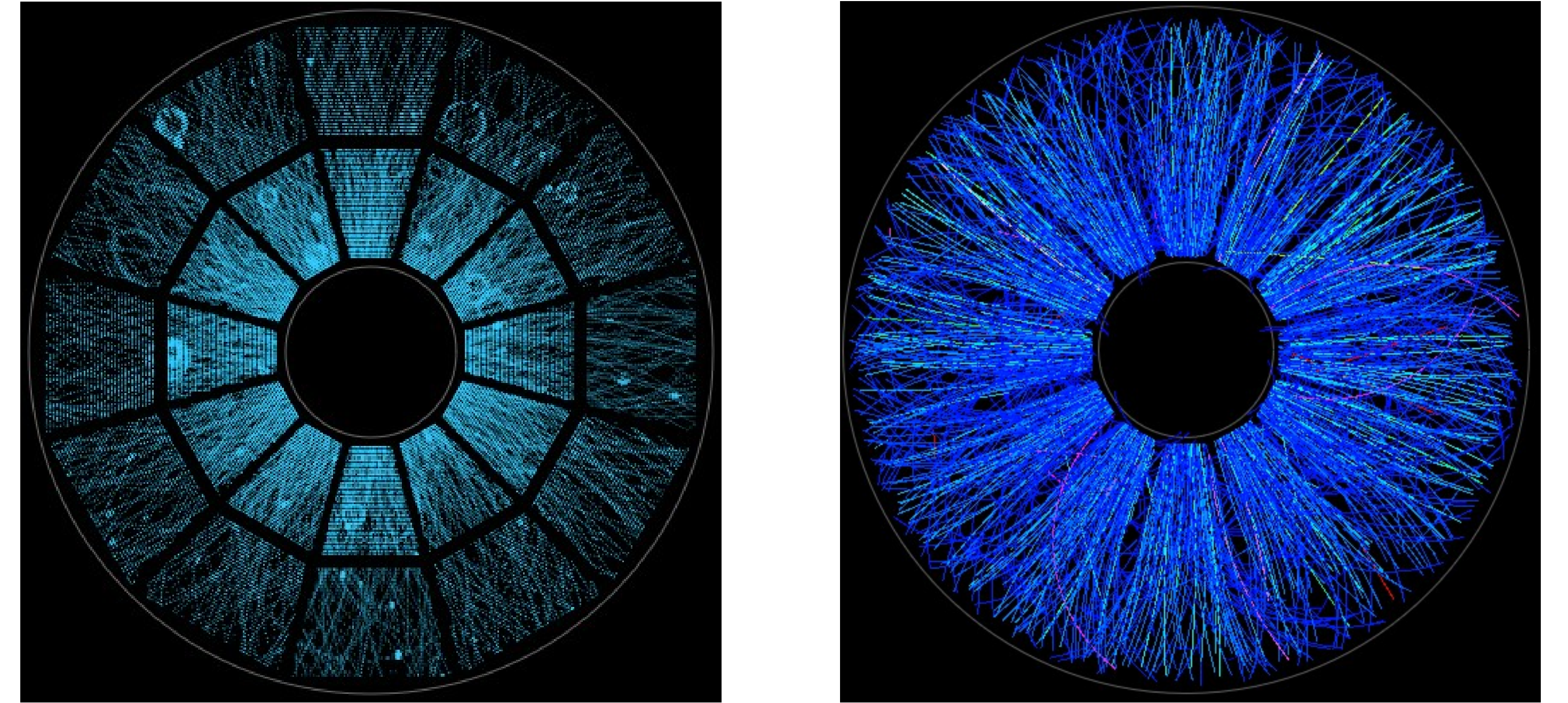
Number of pions per event with $|\eta| < 0.25$ and $0.45 \text{ GeV} < p < 0.5 \text{ GeV}$ using raw and uncorrected data produced through FastOffline for the $\sqrt{s_{NN}} = 19.6$ GeV data set (left) and the $\sqrt{s_{NN}} = 14.6$ GeV data set (right).

This and other similar run-by-run QA shows the effects of changes, such as TO offsets or coggging adjustments, and allowed the identification and resolution of other issues.

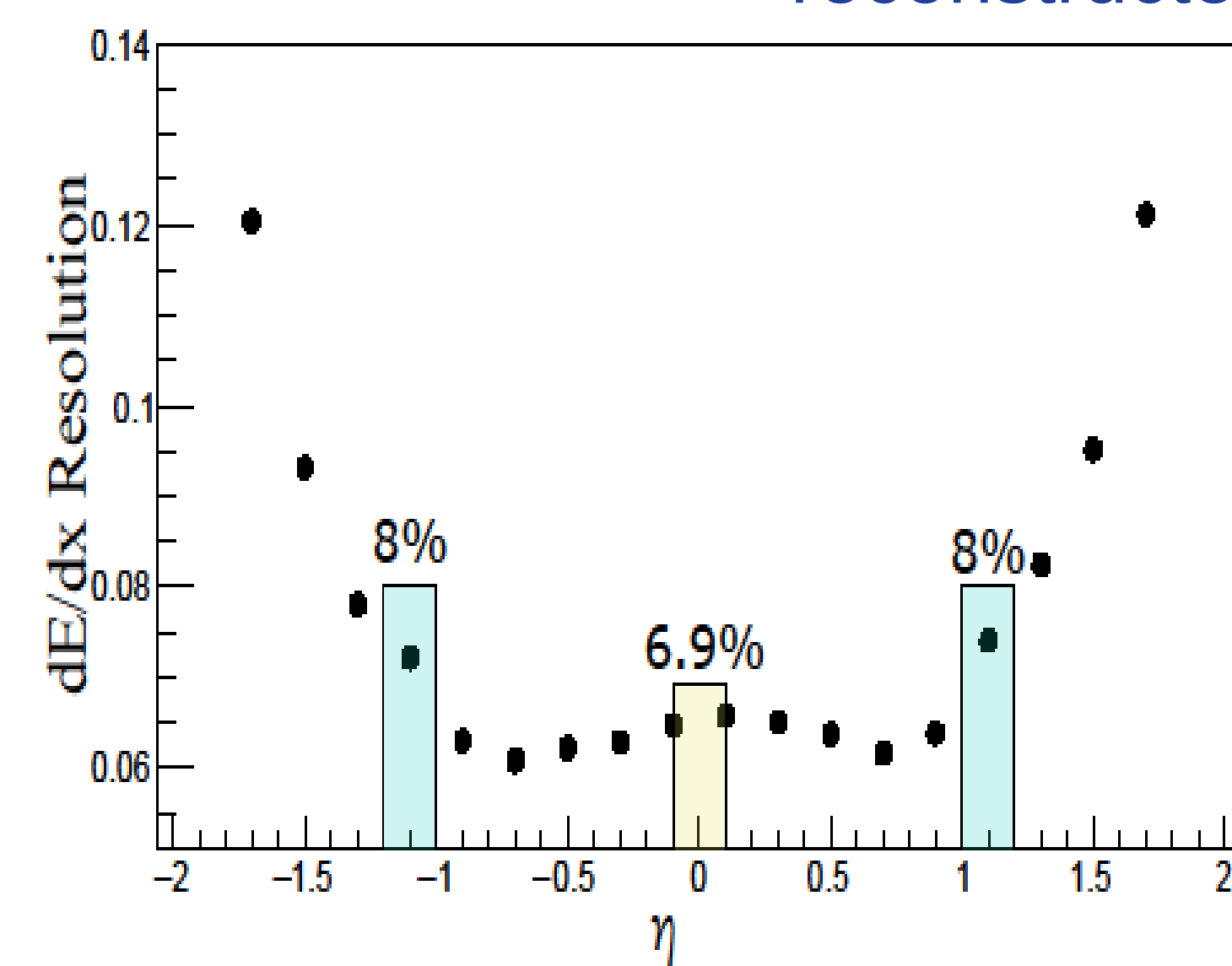
New Detector QA

Inner TPC Upgrade

The iTPC adds more pads to the inner sectors of the TPC and improves the dE/dx resolution and momentum range accessible by STAR.



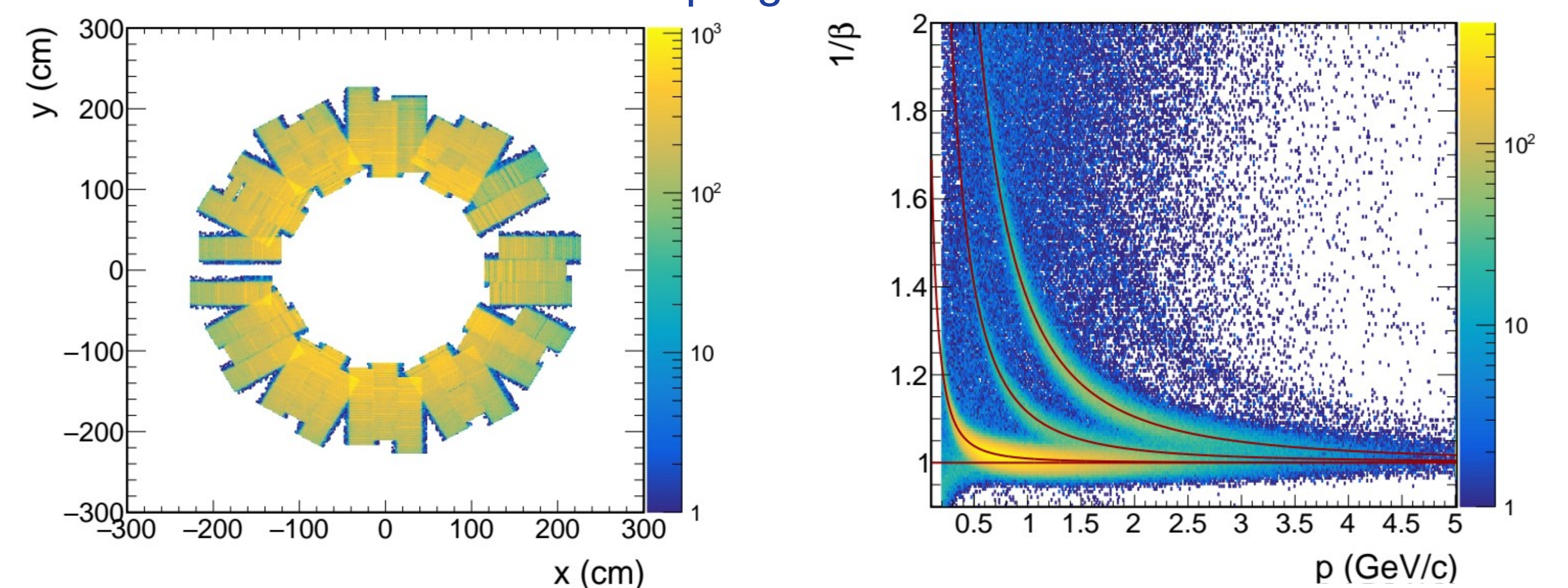
Clusters in the TPC with the newly installed iTPC upgrade (left) and reconstructed tracks (right).



dE/dx resolution achieved after the iTPC upgrade as a function of pseudorapidity. The blue and yellow bars show the Ultimate Performance Parameter targets, which are exceeded.

Endcap Time of Flight Upgrade

The eTOF adds a new subsystem to the East endcap that allows for the identification of high rapidity particles which covers $-1.62 < \eta < -1.09$ for collider events. It is essential for the success of the STAR Fixed Target program.



Hit map (left) and $1/\beta$ (right) from day 098.

Conclusion

We have in place a multi-step quality assurance program that successfully ensures that the data collected are of high quality and that the statistics obtained match or exceed the proposed numbers necessary to conduct various analyses on the data from Run 19. This multi-step approach has allowed us to find and resolve a number of issues that occurred during the run.

Disclaimer

All figures shown are produced using FastOffline data, which are uncalibrated and have minimal corrections applied. No physics should be inferred from these figures.



Acknowledgments



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