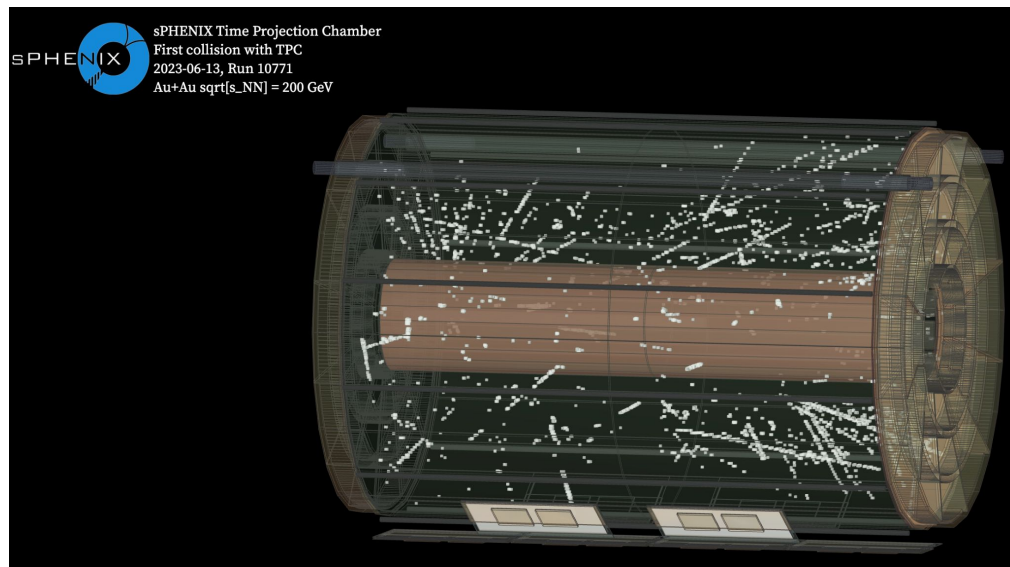

TPC First Collision Display

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For the sPHENIX TPC Group
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- First Au+Au collision in TPC with full HV
- Significance
 - First collision observed in TPC
 - Majority of TPC acceptance is operational
 - Can almost make out the primary vertex position from visual tracking
- Caveats and details (in case for QA):
 - This is within first 10 events after HV turn on to a reasonable setting (i.e. not highly selected display to hide problems)
 - No B-field in this run, expect straight tracks
 - Very wide vertex distribution from special low lumi tune at RHIC, this particular event seems have vertex=80cm to the left
 - The non-vertex pointing tracks are likely collision-induced secondary particles (e.g. photonic conversion on inner field cage or calorimetric albedo)
 - Inner 10cm of TPC (R=20-30cm) is distortion shaping region and no readout by design
 - ADC-voxel with signal displayed (i.e. no clustering, no distortion correction, no tracking)



Extra Information

Previous Presentations Where Figure Was Shown

[Physics Coordination Meeting, June 16, 2023 - Charles Hughes](#)

- Single time frame from segment 0000 of run 10771
- Displaying approximate x,y,z position of all samples in all waveforms with an ADC at least 100 counts above the first ADC sample in the waveform
- X,Y mapping from channel information within a sector done using phi and PadR values for [R1](#), [R2](#), and [R3 csv files here](#), global phase shift done using factors of $2\pi/12$ radians to get correct sector position
- Z mapping estimated using the 10th sample in the waveform as approximately occurring at +/- 105 cm (endcaps), 255th sample at central membrane (0 cm), evenly spaced for all other samples between those limits
- Output processed into both a json file that can be passed to the sPHENIX Event Display [website](#) and a root file containing the x,y,z positions of all samples passing the cut

