Update on Jet V2 in Isobars

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Motivation

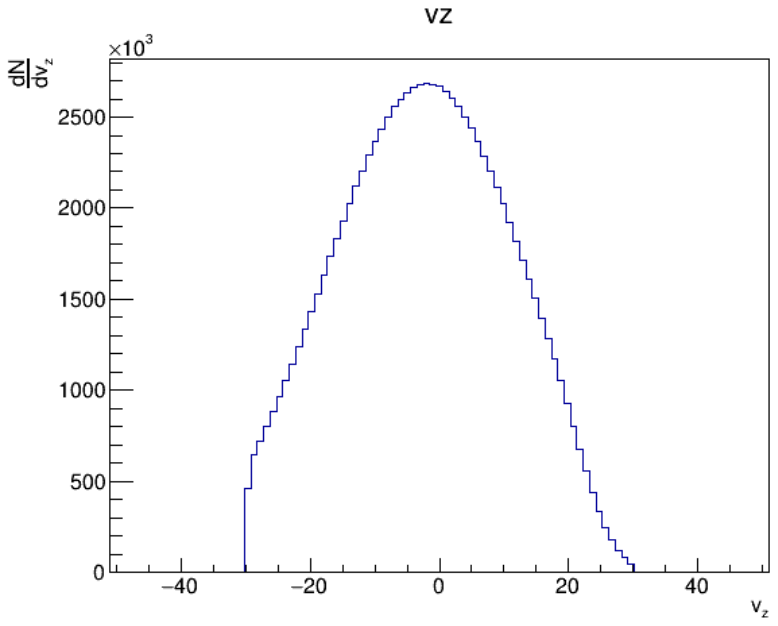
- Jets passing through QGP medium interactions
- We think of this as a path-length dependent effect
- Jets in event plane pass through less medium -> less suppression
  - Greater jet yield in plane than out of plane
- EPD allows reduced autocorrelation between Ψ_2 determination and jet finding
  - Jets found $|\eta| < 1$, Ψ_2 found $2.1 < |\eta| < 5.1$

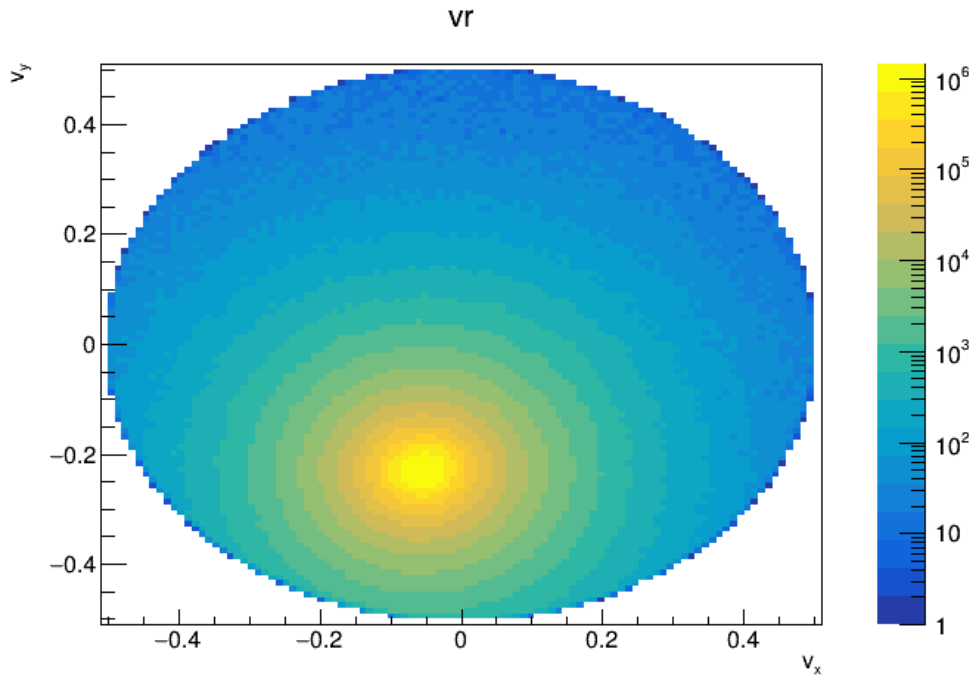
Dataset

- 2018 Isobar Run
- Both RuRu and ZrZr at $\sqrt{S_{NN}} = 200$ GeV
  - Will analyze separately eventually
- Using PicoDST format
  - P21id production
- Using three triggers
  - Minbias for event plane corrections
  - bht_vpd30 and bht_vpd100 for jet measurements
- Currently looking at ~20% of data

Event Cuts

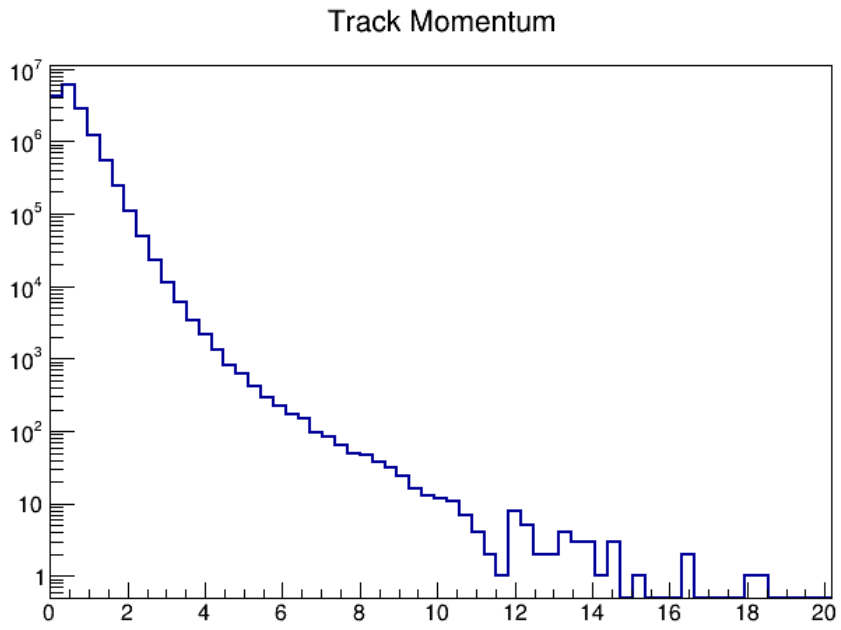
- Primary Vertex
  - $-35\ cm < v_z < 25\ cm$
  - $v_r < 2\ cm$
  - $\left|v_z - v_{z,VPD}\right| < 6\ cm$

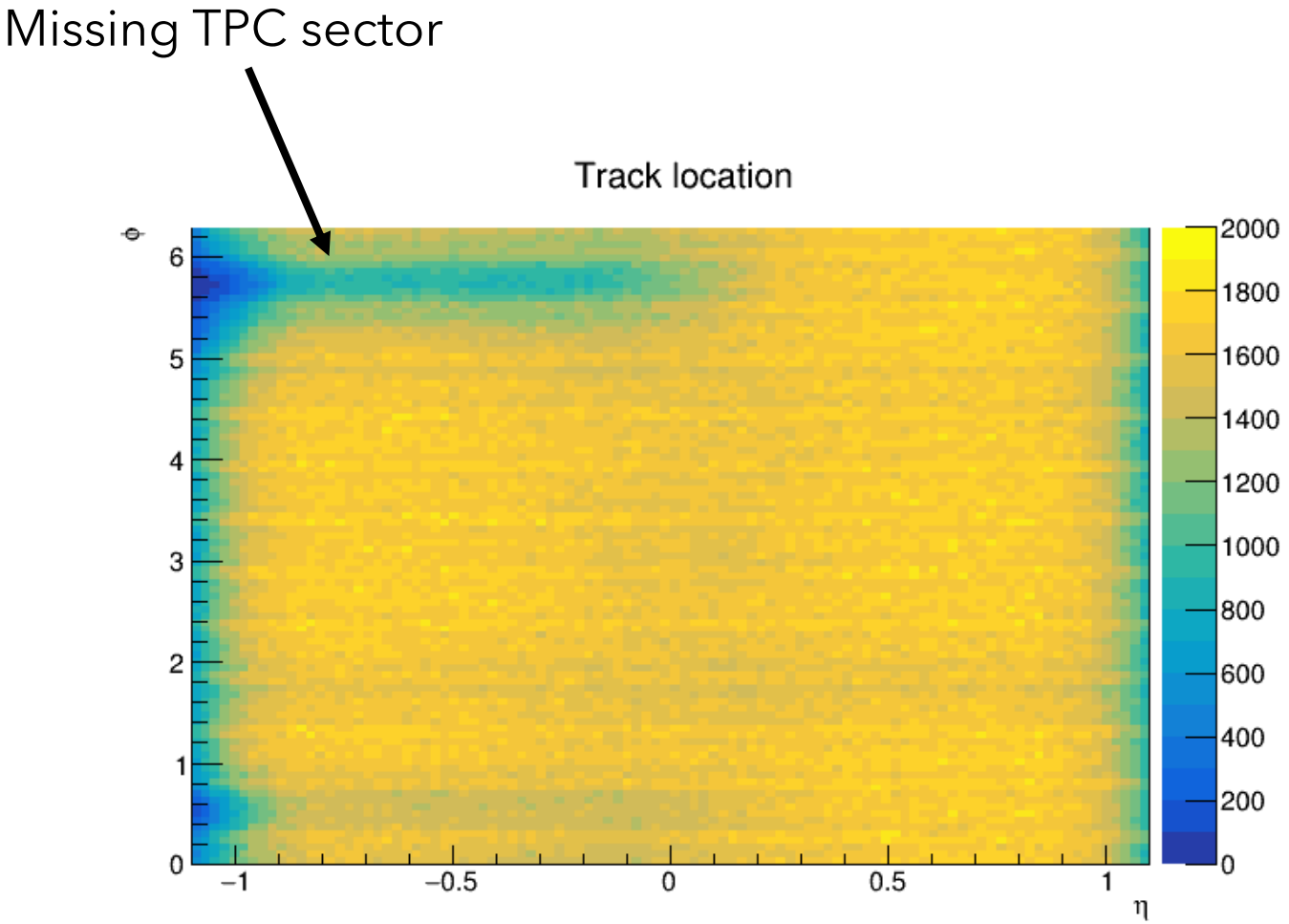




Track Cuts

- $0.1 < P_t < 30$ GeV
- DCA < 1 cm
- nHits > 15
- nHits / nPossible > 0.52

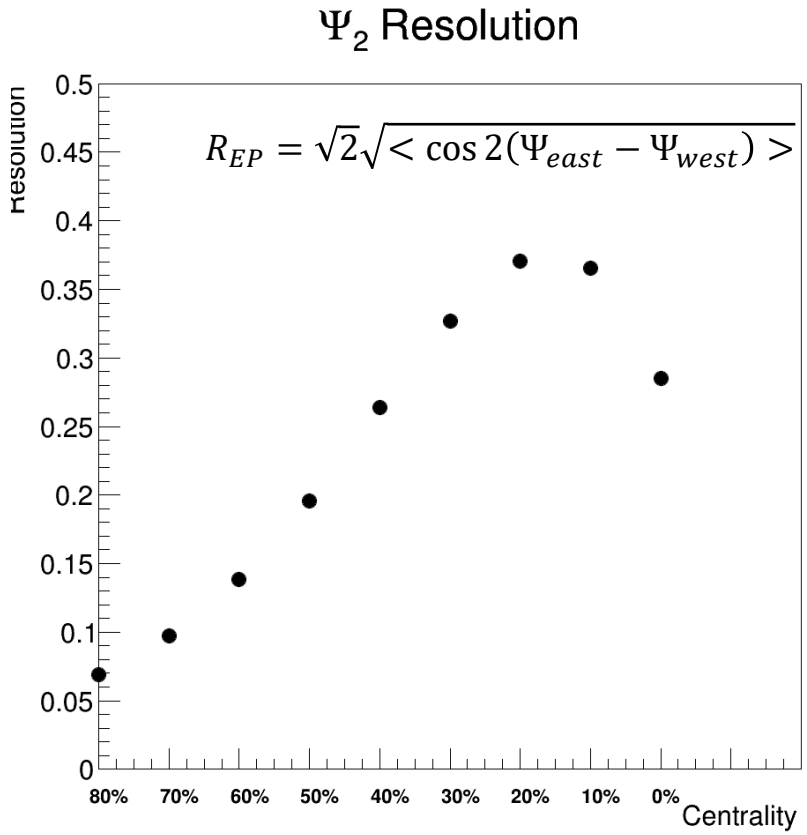


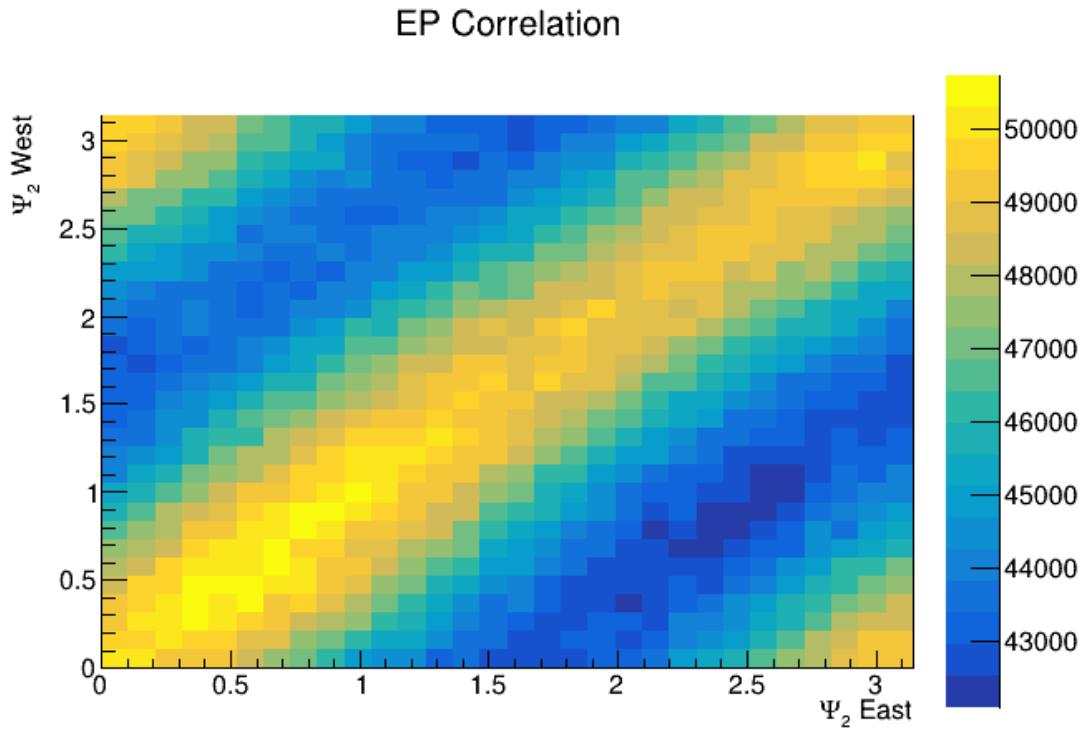


EP Resolution

Event-plane resolution versus centrality - with Isaac's help | The STAR experiment (bnl.gov)

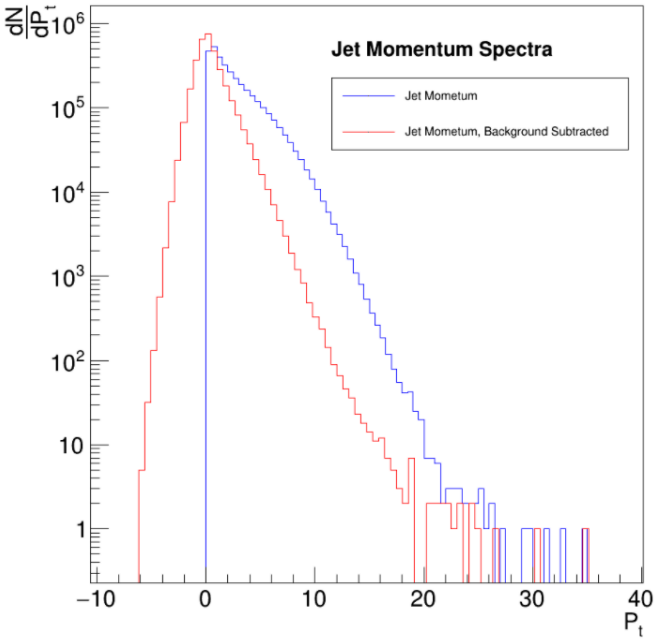
- Resolution calculated using sub-event method
- Resolution seems in line with what has been found by OSU group

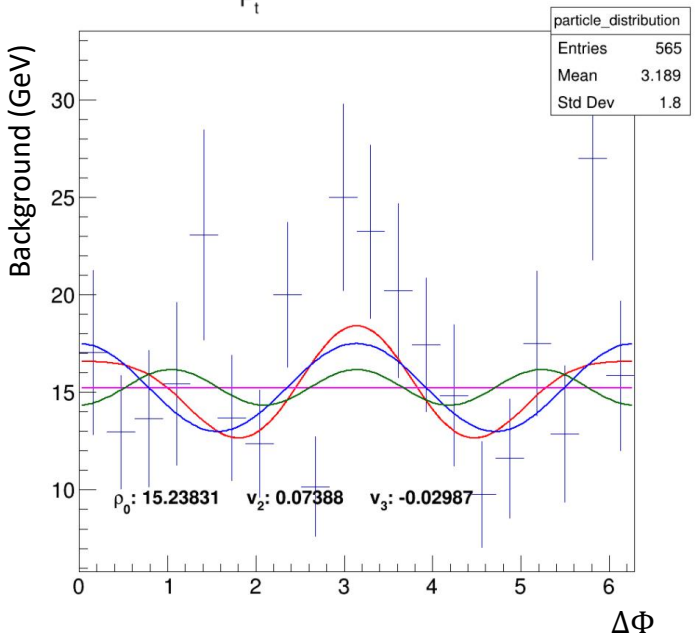




Jet Finding

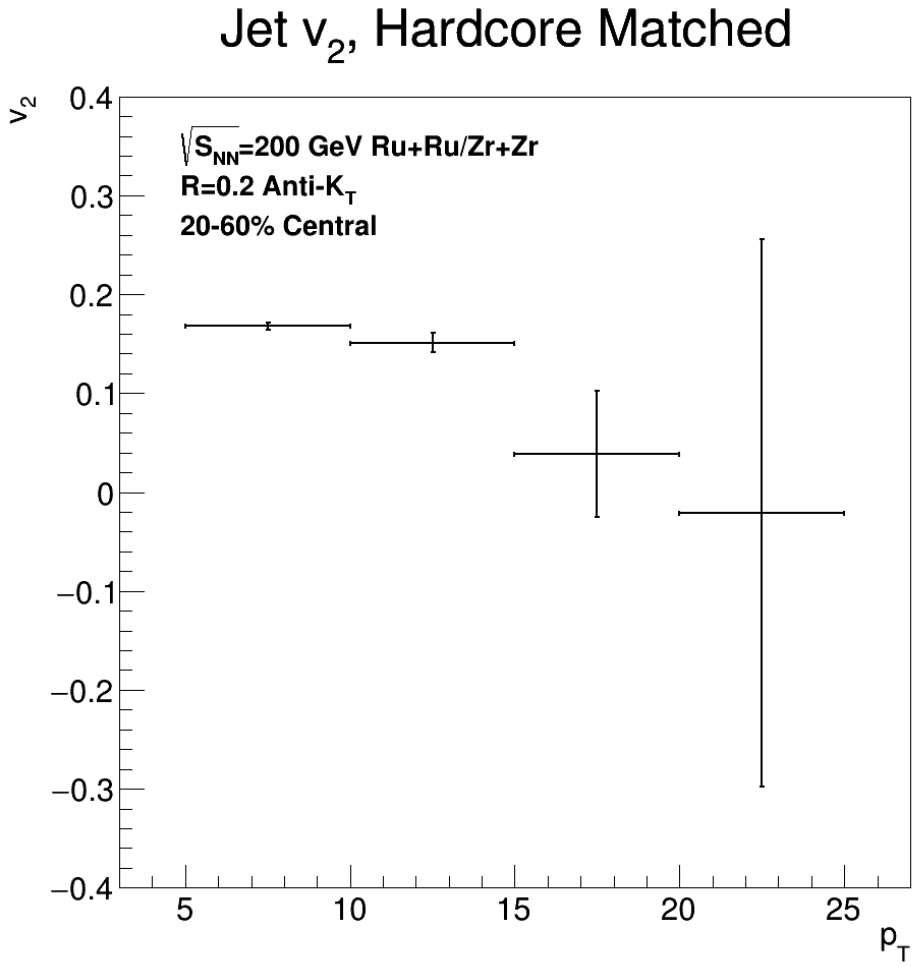
- R=0.2 Jets
- Anti-K_T algorithm
- Currently only track jets
- Requiring hardcore matching
  - Jets formed with > 2 GeV tracks
- Using rho area subtraction
  - $p_{T,sub} = p_t - \rho * A_{jet}$
- Attempted event-by-event modulated background
  - Not enough statistics for good fit
- TODO: plot δp_T to study how much background is subtracted as function of angle to event plane

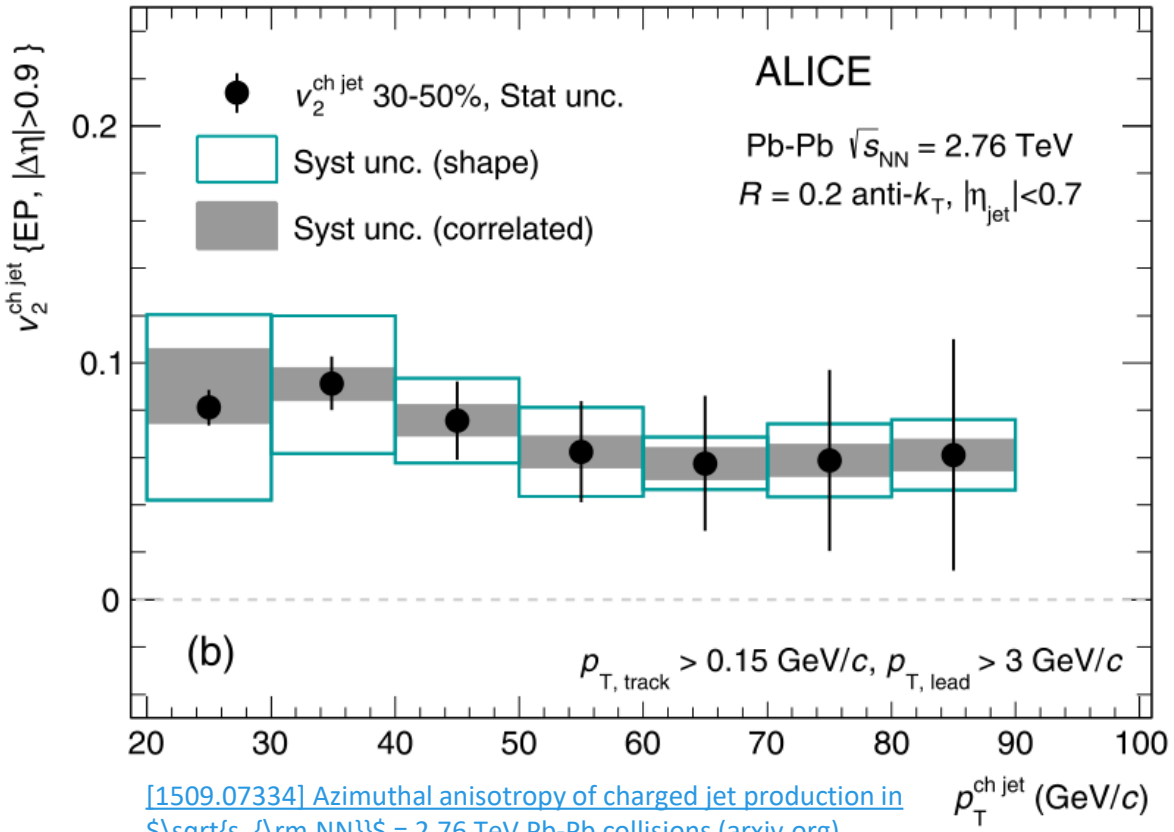




Jet V2

- v_2 is very statistics hungry, but we seem to be in the ballpark of the ALICE result
- A few more tweaks and will run over full dataset again

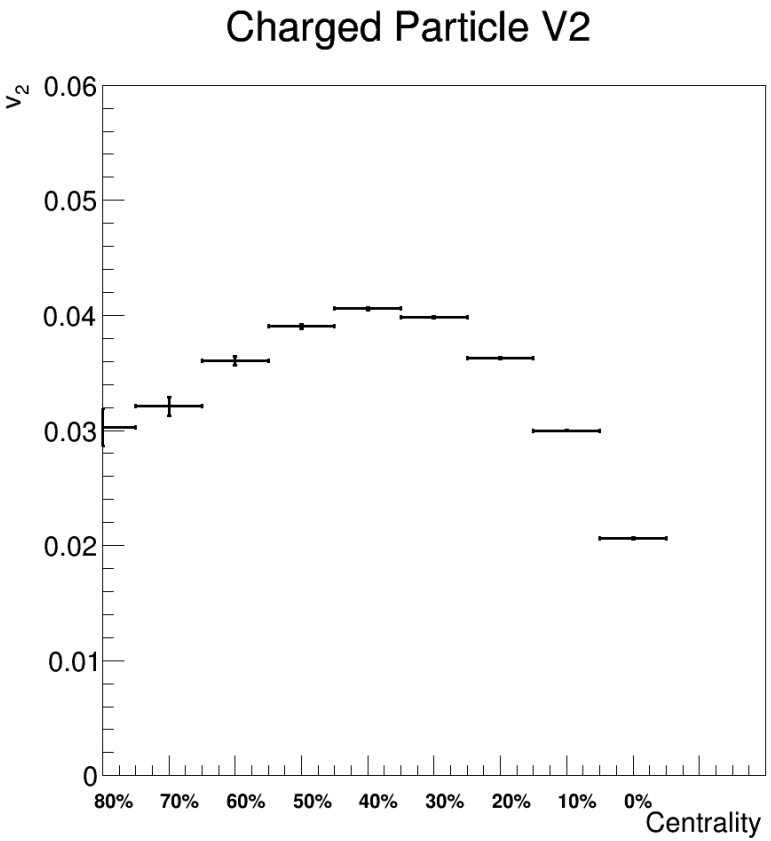


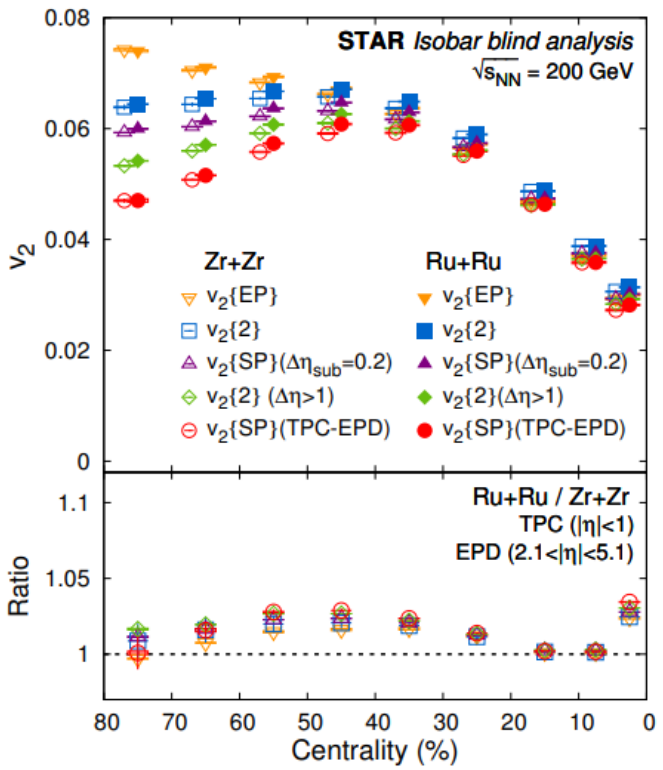


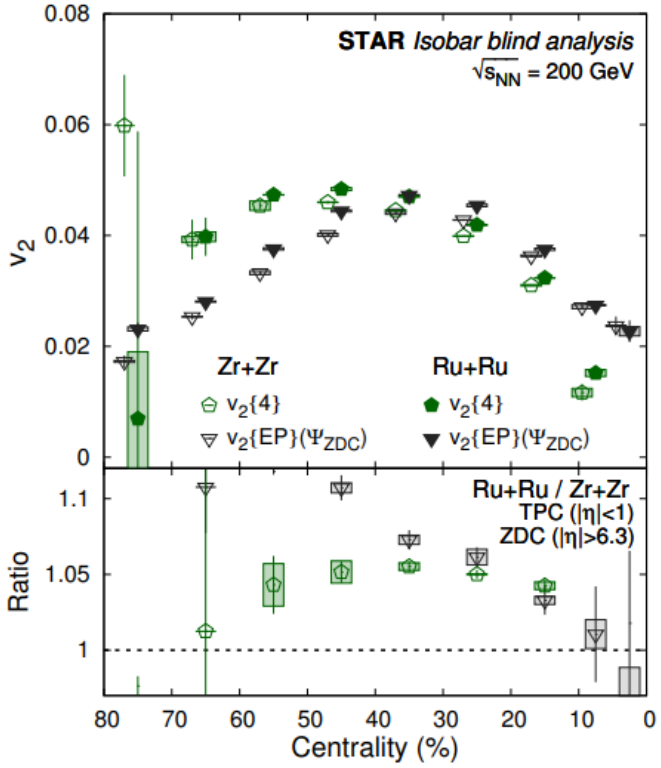
[1509.07334] Azimuthal anisotropy of charged jet production in $\sqrt{s_{\rm NN}}$ = 2.76 TeV Pb-Pb collisions (arxiv.org)

Charged ParticleV2

- Calculating charged particle v_2 to validate methods
- Similar to CME results, still figuring out how to interpret
- Want to implement in modulated background subtraction







2109.00131.pdf (arxiv.org)

Next Steps

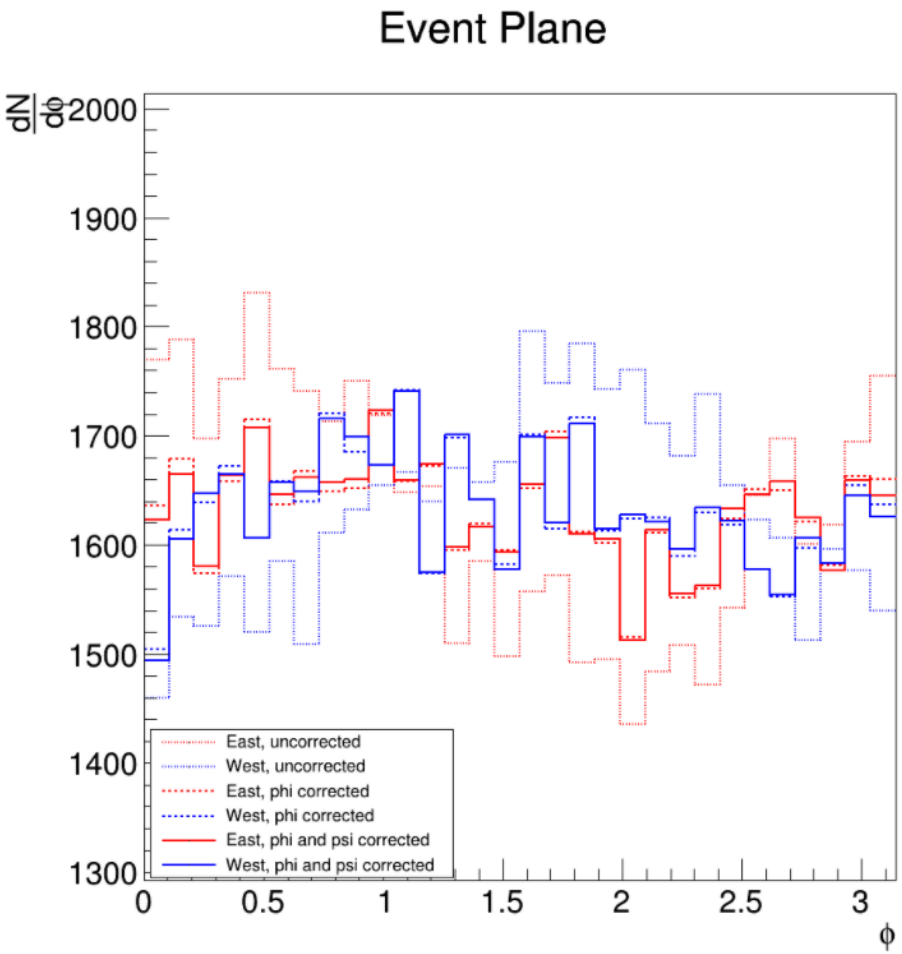
- Working towards preliminary result for Hot Quarks in October
- Implement modulated background
- Run over full dataset
- Separate by species

Questions?

BACKUP

Event Plane Finding

- Tiles with less than 0.3 nMips suppressed to 0
- Tiles with more than 3 nMips truncated to 3
- Corrections calculated for Φ weighting and Ψ shifting
- Calculated by centrality class
  - Using centrality16 definitions



$$\Psi_2 = \frac{1}{2}\tan^{-1}\frac{\Sigma_i w_i \sin(2\phi_i)}{\Sigma_i w_i \cos(2\phi_i)}$$