Wayne State Comments

On behalf of the Wayne State group we want to congratulate the PA's for this extremely well written paper and for the very exciting physics results presented.

Figures:

Fig 3 - Would be good to see Data compared with the PTYHIA + GEANT here. Just to see if the multiplicity is captured in the embedding in both the scale (mean) and in the resolution (sigma).

A: We did look at this and had carefully discussed within GPC. It is known that PYTHIA does not provide a good description of forward data, so it is not surprising data & MC comparison for EM-jet multiplicity is not good. A full data & MC comparison may take quite long efforts as learned in past several years. Thus GPC decided to put “the measured EM-jet multiplicity” in the paper, as they are useful information for this measurement although they are not physics multiplicity that need full MC understanding.

Fig 4 and on - is it a standard to mark p^{\uparrow} + p within STAR. I have seen some papers where it’s just written as p+p?

A: The arrow means one beam is transversely polarized. This is common in spin paper.

Fig 5 - Put the 'not shown' in the second panel on a second line in the first panel

Done

Analysis:

There are a few places where the phrase ' the data sets used in this analysis' or 'paper' are used quite a few times would be good to try to avoid that.

Done, we only keep “this paper” in the new version (dated by 1109).

Like before for Figure 3, would be good to see a comparison between data and embedding for these observables.   
A: the same answer as the first comment.

Corrections and Systematics –

How different are the energy resolutions of the pi0 and EM jet?  A little bit surprising was, that the corrections are of order 1 which might the case for the energy scale, but if the width of the resolutions are large then one might not include all the smearing effects yes? A quick clarification would be appreciated.

A: As we discussed in Sec.III-A, the energy uncertainty of pi0 (3~4%) is about half of jet (~8%) as an upper limit including correlation. This uncertainty comes from detector effects. However, the correction of jet energy from detector level to particle level is 0.8-0.9 for 500 GeV data and 0.9-1.0 for 200 GeV data, as mentioned in Sec. III-C. So, they are at different level. The particle level jet energy can be used for theoretical comparison. There is no such correction for pi0.

Results:  
1. We found that having a separate sub-section that discusses the comparison with calculations a bit discontinuous for the reader, maybe this can be integrated when the theory is discussed and when the figure comes up?

A: We think the predictions are correlated due to the complexities of the origin of the A\_N, thus are better to be discussed in the same section. And another reason is thatthe predictions are just the same for several figures, so it is not necessary to compare them to the measurements again and again in different sections.

2. Maybe this is a naive question, how can the theory calculations get close to the A\_N as a function of x\_F but under predict it as a function of pion pT? Comparing figures 4 and 5.

A: Although we don’t know the detailed structure of the theory calculation, they seemed fixing the pseudo-rapidity range in their previous fitting of global data including STAR 2008 data. In general, x\_F, eta, and p\_T are correlated.

Grammar:

Line 223: "STAR (Solenoidal Tracker At RHIC) detector at RHIC" is redundant, but it also allows for the definition of RHIC on the next line. Consider revision

A: We now introduced STAR and RHIC earlier around Line 205 and 208 in the new version.

Line 552: "...reach up to 0.6 and therefore the largest asymmetries." Therefore must have commas on both side of it. i.e. "...reach up to 0.6 and, therefore, the largest asymmetries."

A: The sentence is now modified as: “The $x\_\mathrm{F}$ of 200 GeV data reach up to 0.6, where the largest asymmetry is observed.” See Line 585-586 in the new version.

Line 688: "...azimuthal distribution of particle's transverse..." Should be either "particles'" or  "a particle's". It's unclear whether it's intended as plural or singular

Done, with “a particle’s….”

References:

1. Link not working for Ref [4] A. Adare et al. (PHENIX), Phys. Rev. D 90, 012006(2014), arXiv:1312.1995 [hep-ex]. Please find link here: [https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.101.222001](https://urldefense.com/v3/__https:/journals.aps.org/prl/abstract/10.1103/PhysRevLett.101.222001__;!!P4SdNyxKAPE!TIC7ASoZlMGDp1ug_MktlBdqoIMpSpU6nl2ByDMEcUaVLP52ScSgvl9YYbU3KrqvMhk-iZbo$)

Done

2. Link not working for Ref [19] Y. Koike and K. Tanaka, Phys. Rev. D 76, 011502 (2007),arXiv:hep-ph/0703169. Please find link here: [https://journals.aps.org/prd/abstract/10.1103/PhysRevD.76.011502](https://urldefense.com/v3/__https:/journals.aps.org/prd/abstract/10.1103/PhysRevD.76.011502__;!!P4SdNyxKAPE!TIC7ASoZlMGDp1ug_MktlBdqoIMpSpU6nl2ByDMEcUaVLP52ScSgvl9YYbU3KrqvMpddwNeO$)

Done.

3.  Check Ref [35] S. STAR, .

A. This is reserved for the pA paper (just passed collaboration review), and will be updated once it appears in arXiv.