82 not clear what exactly was done in [24], ``in a single event'' looks incorrect

3> See previous comment on this point.

Answer: We changed the text to read "in all events" as suggested.

166 inelastic cross section is ambiguous (and likely not correct). What is meant by inelastic cross section here?

3> Has to be corrected as we discussed in the phone meeting. Suggest to change to “inelastic hadronic cross-section”.

Answer: done.

203 What is the systematic error on vn(pt) for kaons with 75\% purity?

3> The answer is not clear. Please update according to the discussion at the phone meeting

Answer: changed the text according to discussion in our phone meeting to: "For \kaon, the minimum purity of 75\% was used however the results were extrapolated to 100\% purity and used in the systematics.”

eq 10 a similar question as to eq.4

3> I do not see the relevance of the Pearson coefficient to these definition. Please clarify.

Answer: you are correct, I didn't understand the question originally. Assumed you meant to ask why sqrt(c2222) and not sqrt(c22). This could be better explained with the calculations of Jean-Yves Ollitraut in https://arxiv.org/pdf/1502.02502.pdf, Equation 3 in which

v4{psi2} = Re<V4(V2*)ˆ2> / sqrt(<|V2|ˆ4>).

The denominator in this equation translates to sqrt(c2222).

Chapter 5 With a very few exceptions, it is totally unclear why these are other cuts were selected for the systematic uncertainty estimates.For example, why decay vertex was varied from 5 to 10 and not to 15 or 20? What exactly was the purpose of this test. Similarly with all other

tests. Even when the purpose was clear. e.g. using different PID method to achieve a better purity, it was not clear of the difference was extrapolated to 100\% purity... or something else was done

3> Not clear. Please clarify in accordance with the discussion at the phone meeting

Answer: In the phone meeting we discussed the choice of purity and the extrapolation to 100% purity for kaons. So now the text reads: "For \kaon, the minimum purity of 75\% was used however the results were extrapolated to 100\% purity and used in the systematics."

Fig 6 and following.One would need to compare the relative splitting to that on linear modes

3> I suggest to expand, see below

Answer: done, it now reads:
"The features seen in the measurement of non-linear flow modes can be further studied by comparing to that of anisotropic flow coefficients. Such comparisons have been performed for $v_{4,22}$(\pT) (this study) and v_{4}(\pT) measurements \cite{Acharya:2018zuq} by taking the difference between pions and protons at a given \pT~in both modes and normalising it by the integrated flow of the corresponding mode for charged particles \cite{Adam:2016izf}. This comparison is shown in Fig. \ref{massOrderingComparison} for 0-5\% up to 40-50\% centrality interval. In this figure, at low \pT~region (0 <~\pT~< $2.5-3$ \GeV) where mass ordering is prominent, the comparison shows two features. At very low \pT~values~(\pT~< 0.8 \GeV), the ratio for v_{4} shows slightly lower magnitude with respect to that of $v_{4,22}$ from 0-5\% up to 20-30\% centrality intervals. At more peripheral collisions, the ratios are compatible. This observation, though based on one datapoint, hints to different mass orderings in this \pT~region. If this difference and its centrality dependence persists for lower values of \pT, it could indicate that hydrodynamic evolution is reflected differently in v_{4} and $v_{4,22}$ and could be explained by the contribution of ε_{2}^{2}. By increasing the \pT~value (0.8 <~\pT~< $2.5-3$ \GeV), this difference disappears which points to a similar mass ordering between v_{4} and $v_{4,22}$ at this \pT~region. In the intermediate \pT~region (\pT~> 2.5 \GeV), the same comparison shows that the results are compatible in all centrality intervals within one standard deviation indicating similar particle type grouping in v_{4} and $v_{4,22}$.

This observation suggests that quark coalescence affects both flow modes similarly.”

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line 45, Refs. Add paper Snellings+Miller. If keeping [6], add [12].

Answer: done. Added both.

46-47: ==> and the fluctuations in the initial energy density distribution in the …

Answer: done. We rephrased it a bit. It now reads: "the initial energy density in the transverse plane which fluctuates from event to event”

54: — see old comment

Answer: done.

65: add “In the Monte-Carlo Glauber model, together with…

Answer: done.

70: ==> In he model study […] it was shown that the higher … are better scale with cumulant-based definition …

Answer: done.

73-74: The logic is somewhat inverted here. Probably better ==> “This observation further support the earlier ideas that the higher order flow terms, Vn (N>3) obtain…

Answer: done.

79-80: We have to discuss somewhere if this representation makes sense, e.g. if \xi’s are functions of pt

Answer: sure but here we don't measure \xi and we just introduce it as a coefficient to the contribution from lower harmonics before we even discuss pT dependent measurements of vnmk.

85-86: Not clear why only LHC results mentioned here. Probably better

to make it more general and refer to a review.

Answer: added a review paper from 2008 (arxiv:0809.2949), if there is a better review please let us know.

104-108: a bit handwaving. Consider to shorten, e,g,"The pt dependent … bring additional information, in particular useful for understanding the mechanisms behind the developing of mass ordering at low pt and particle type grouping…

Answer: We shortened this paragraph.
195-196: Why the dca cut in z direction is that large? With hits in silicon the track pointing to the vertex should be better than that.

Answer: Thanks, this question was also asked by Panos. We answer this in detail in the answers to his comments on line 196 of version 0.2.

233: In general, cuts in the Armenteros-Podolanski plane are rather dangerous, as they lead to "artificial" mass peaks. Was it studied in LF (I am not expecting you to do it, but wonder if you know anybody studied it)

Answer: I personally don't know but I will ask from LF people and come back to you.

360-361: In general the statement is not correct. The "depletion" has little to do with flow. The "interplay" is more complicated: particle at lower pt's are produced mostly by parts of the entire system with smaller collective expansion velocity - it happens to be the parts in the "out-of-plane" region. Thus it leads to smaller flow.
I propose just omit the last sentence in this paragraph and move corresponding references to the previous sentence ==> … and radial flow […]

Answer: Panos had a similar comment on this section. We changed the text accordingly. So if you agree we will leave it as following:
"In particular, radial flow creates a depletion in the particle spectra at lower pT values which becomes larger in- than out-of plane due to the velocity profile. This naturally leads to lower v4,22 at a given value of pT for heavier particles [55, 56, 74]."

370-375: This part is rather unclear. I would suggest to rewrite it along the lines: “This grouping find a natural explanation in the picture of particle production via quark coalescence […] indicating, in particular that the flow develops first at the partonic stage. In this picture, in the intermediate transverse momenta the flow of mesons is roughly twice of the flow of constituent quarks, and flow of baryon is three times of that, the so-called NCQ scaling. ALICE measurements showed…

Answer: done.

433: discrepancy —> difference ???

Answer: done.

section 6.3: As we all agreed — it is great to have such a section. A figure would be a plus. It is not totally clear how best to present the result sin the figure. I would propose to try to show the difference between pions and protons, but normalized separately for “plain’ vns and NLF modes, by the corresponding integral values.
In general for such a discussion I would expect very similar dependence at higher pts (“coalescence” effect to be the same in two cases), but slightly different at smaller pt, in the mass ordering region, defined by interplay of radial flow (the same in two cases), thermal velocities (a gain the same) and anisotropic flow (different for “linear” and “nonlinear” modes.

Answer: done. We added a figure with the suggested ratio.