

## Answers to Journal's Referee Comments

### :Received at Nov-09-2017

#### PROBLEMS WITH MANUSCRIPT:

In reviewing the figures of your paper, we note that the following changes would be needed in order for your figures to conform to the style of the Physical Review. Please check all figures for the following problems and make appropriate changes in the text of the paper itself wherever needed for consistency.

Figure(s) [1, 3, 4-8, A.1-A.4; please check all, amend where necessary]  
Please increase the font size (axis labels, axis scale values, legend, etc.). Please ensure that all lettering is 2 mm or larger (1.5 mm for superscripts and subscripts) after scaling to the final publication size. Note that the column width is 8.6 cm (twice that amount plus gutter for extra wide figures).

R : We went through the figures and increase the sizes as much as we can.

Figure(s) [8-9; please check all, amend where necessary]  
Please spell out 'without'.

R : Done, also for other figures.

Figure(s) [A.1-A.4; please check all multipanel figures, amend where necessary]  
Please consider printing figure sublabels on the figures unless there are other, clear identifiers. The preferred form is lowercase letters in parentheses: (a), (b), etc.

R : We have added sub labels suggested.

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Report of the Referee -- CK10547/Acharya  
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This paper presents new results on Pb+Pb collisions at  $\sqrt{s_{NN}}=2.76$  TeV from the ALICE experiment on the centrality and momentum dependence of correlations between various orders ( $n=2,3,4,5$ ) of the particle azimuthal angle harmonics using symmetric cumulants (SC) and normalized symmetric cumulants (NSC). New data are presented, together with results previously published in PRL, with a very thorough comparison to 3 different "state of the art" models in an effort to extract as much information as possible about the sensitivity to model assumptions and parameters, and the robustness of the conclusions which can be drawn from the comparisons. The paper provides a clear and thoroughly referenced description of the importance of the measurement and the analysis method. The results are new and interesting and worthy of publication in PRC.

R : Thank you for your praising summary and detailed comments.

I have only minor corrections and comments:

Figures 1, 2, 4, 5, 6 and 8 should show negative values on the x-axis labels where the SC and NSC values are less than zero.

R : We presume that you are pointing to y-axis instead of x-axis. x-axis is centrality percentile and ranges look fine to us, all positive. As for negative values of y-axis, both SC(3,2) and SC(4,3)(also for NSC) are shown as negative values. We tried to increase the font size of axis labels and axis scale values for better visibility.

Figures 2 and 3 show results versus a minimum  $p_T$  cut, while the labels in the figures incorrectly indicate that particles in the range  $0.2 < p_T < 5$  GeV/c were used for the analysis. The label should indicate the actual range:  $p_{T,min} < p_T < 5$  GeV/c, and this text can then be removed from the x-axis labels. The (A),(B), and (C) panels of figure 3 are apparently the  $p_T$  integrated  $v_n$  values, with  $p_{T,min}=0.2$  GeV/c, but the text denotes the  $p_T$  integrated values as  $v_n\{2, |\Delta\eta|>1\}$ , where the 2 presumably indicates the  $p_{T,min}$  value, which presumably should be 0.2 GeV/c instead. The restriction to  $|\Delta\eta|>1$  should also be noted in the figure labels or captions.

R : Done. We now have changed " $0.2 < p_T < 5$  GeV/c" to  $p_{T,min} < p_T < 5$  GeV/c and removed  $p_{T,min} < p_T < 5$  GeV/c from the x-axis label as you suggested. As for Fig2, we added " $|\Delta\eta|>1$ " in the figure label and added a text to indicate the range of integrated  $p_T$  range.

More care should be taken about use of "centrality" versus "centrality percentile". Normally, one says that the collisions are more central, i.e. centrality increases, for the smaller centrality percentiles. So for example, in discussing the results of figure 2 it is clearly meant that the SC(n,m) get larger as the centrality percentile increases, not as centrality increases.

R : Done.

p.9: 'an additional fluctuations' should be "additional fluctuations"

R : Done.

p.9: "achieved shortly" should be "achieved quickly"

R : Done.

p. 10: "cannot - neither - nor" should be "cannot - either - or" or "can-neither-nor"

R : Done.

p. 14: In reference to Eq. 5, a comment about the statistical and systematic errors of the model calculations should be added. The  $N_{dof} = 5$  points included were from the 5 centrality bins in the range of 5% to 50% presumably - there are only 4 bins in the 10% to 50% range.

R : There is no systematical errors on the model calculations at this moment and statistical errors of the models are now added in quadrature as well to the calculation.

We have indicated only 4 bins are used for the calculations. We restricted the range because we don't have the EKRT+Hydro calculations with param1 for 5-10% bin.