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Tracing the emergence of collective phenomena in small systems

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Event geometry and initial state correlations have been invoked as possible explanations of long-range rapidity correlations observed in high multiplicity pp and pPb collisions. We study initial state momentum correlations and event-by-event geometry in p+Pb collisions at \sqrt{s}=5.02 TeV by following the approach of extending the impact parameter dependent Glasma model (IP-Glasma) to 3D using JIMWLK rapidity evolution of the incoming nuclear gluon distribution [1].
Investigating the non-trivial rapidity dependence of the observables, we find that geometry is correlated across large rapidity intervals whereas initial state momentum correlations are relatively short range in rapidity. Based on our results, we discuss implications for the relevance of both effects in explaining the origin of collective phenomena in small systems.
[1]. B. Schenke and S. Schlichting, Phys. Rev. C, vol. 94, no. 4, p. 044 907, 2016
[2]. B. Schenke, S. Schlichting and P. Singh, Rapidity dependence of initial state geometry and momentum correlations in p+Pb collisions [to appear]

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