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Examination of Flow and Non-Flow Factorization Methods in Small Collision Systems

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Two particle correlations have been used extensively to study hydrodynamic flow patterns in heavy-ion collisions. In small collision systems, such as p+p and p+A, where particle multiplicities are much smaller than in A+A collisions, non-flow effects from jet correlations, momentum conservation, particle decays, etc. can be significant, even when imposing a large pseudorapidity gap between the particles. A number of techniques to subtract the non-flow contribution have been developed by experiments at the LHC for use in p+p and p+Pb collisions. Recently, experiments at RHIC have explored the possibility of adopting these techniques for small collision systems at lower energies. In this talk, we systematically test these techniques using the Monte Carlo generators PYTHIA and HIJING, which do not include any collective flow, and AMPT, which does. We find that it is crucial to examine the results of such tests at the LHC and RHIC both as a function of multiplicity and particle p_T . Our results indicate reasonable non-flow subtraction for p+p collisions at the highest LHC energies, while failing if applied to p+p collisions at RHIC. In the case of p+Au collisions at RHIC, both HIJING and AMPT results indicate a substantial over-subtraction of non-flow for $p_T \geq 1$ GeV/c and hence an underestimate of elliptic flow.

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