



Contribution ID: 503

Type: Poster

Feasibility study of multiparticle correlations in flow analyses in CBM at FAIR

Friday 8 April 2022 14:00 (4 minutes)

Analyses techniques based on multiparticle azimuthal correlations are widely used at RHIC and LHC experiments for the measurements of anisotropic flow and related phenomena. These techniques are reliable only when the number of produced particles and the values of flow harmonics are large. This limitation originates from the fact that for flow results obtained with multiparticle correlations, both the statistical error and the most important sources of systematic errors, scale with the inverse powers of multiplicity and flow.

In this poster, we present results from Monte Carlo studies for the feasibility of using multiparticle azimuthal correlations in flow analyses in the CBM experiment at FAIR. The performance in a fixed-target environment characterized with small multiplicities is scrutinized. Both the classical flow observables, $v_n\{k\}$, and the multiharmonic flow correlations obtained with symmetric cumulants, $SC(m,n)$, are presented. The applicability of recently proposed event-by-event cumulants of azimuthal angles in the CBM environment is addressed as well.

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Session Classification: Poster Session 3 T15_1

Track Classification: Future facilities and new instrumentation