Supplemental figures:
Freeze-out radii extracted from three-pion cumulants in pp, p–Pb and Pb–Pb collisions at the LHC

ALICE Collaboration

Abstract

Supplemental figures for the analysis on “Freeze-out radii extracted from three-pion cumulants in pp, p–Pb and Pb–Pb collisions at the LHC” are provided (arXiv:1404.1194).

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Fig. 1: Two- and three-pion Edgeworth fit parameters versus $\langle N_{\text{ch}} \rangle^{1/3}$ in pp, p–Pb and Pb–Pb collision systems for low and high $k_T$ and $K_{T,3}$ intervals. Top panels show the Edgeworth radii $R_{Ew}^{\text{inv}}$ and $R_{Ew}^{\text{inv},3}$ and bottom panels show the effective intercept parameters $\lambda_{Ew}^{\text{inv}}$ and $\lambda_{Ew}^{\text{inv},3}$. As described in the text, $\kappa_3$ and $\kappa_4$ are fixed to 0.1 and 0.5, respectively. The systematic uncertainties are dominated by fit-range variations and are shown by bounding lines and shaded boxes for two- and three-particle parameters, respectively. The dashed and dash-dotted lines represent the chaotic limits for $\lambda_{Ew}^{\text{inv}}$ and $\lambda_{Ew}^{\text{inv},3}$, respectively. The low $k_T$ and $K_{T,3}$ linear fit parameters for pp, p–Pb, and Pb–Pb are $0.436 + 0.403 N_{\text{ch}}^{1/3}$, $0.082 + 0.586 N_{\text{ch}}^{1/3}$, and $0.045 + 0.843 N_{\text{ch}}^{1/3}$, respectively, while for high $k_T$ and $K_{T,3}$ they are $0.332 + 0.405 N_{\text{ch}}^{1/3}$, $-0.054 + 0.585 N_{\text{ch}}^{1/3}$, $0.049 + 0.772 N_{\text{ch}}^{1/3}$, respectively. For pp and p–Pb three-pion, while for Pb–Pb two-pion results are fit.
Supplemental figures

Fig. 2: The ratio of three-pion Edgeworth radii in p–Pb over the linear fit in pp collisions, and the ratio of two-pion Edgeworth radii in Pb–Pb over the linear fit in p–Pb collisions versus $\langle N_{ch} \rangle^{1/3}$ for low and high $k_T$ and $K_{T,3}$ intervals. Errors are statistical, since systematic errors largely cancel in the ratio.

Fig. 3: For illustration: Two-pion correlations versus $q$ for $0.2 < k_T < 0.3$ GeV/c and three-pion cumulant functions versus $Q_3$ for $0.16 < K_{T,3} < 0.3$ GeV/c with extended range. Final-state interactions have not been removed. Only statistical errors are shown.
Fig. 4: Three-pion cumulant correlation functions for three sample multiplicity intervals in pp, p–Pb, and Pb–Pb. This figure demonstrates the span of 3-pion Bose-Einstein cumulants for collisions at the LHC.