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K_S^0 and Λ ($\bar{\Lambda}$) two-particle femtoscopic correlations in PbPb collisions with the CMS experiment

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Two-particle correlations are presented for K_S^0 , Λ , and $\bar{\Lambda}$ strange hadrons as a function of relative momentum in lead-lead (PbPb) collisions at a nucleon-nucleon center-of-mass energy of 5.02 TeV with data samples collected by the CMS experiment. These correlations are sensitive to quantum statistics and to final-state interactions between particles. The $\Lambda\Lambda$ femtoscopic correlation is measured for the first time in PbPb collisions. It is seen that the shape of the correlation distributions varies largely for different particle pair species, revealing the effect of the strong final-state interaction in each case. The source size extracted from the $K_S^0 K_S^0$ correlations is found to decrease from 4 to 1 fm in going from central to peripheral collisions. Strong interaction scattering parameters (i.e. scattering length and effective range) are determined from the ΛK_S^0 and $\Lambda\Lambda$ (including their charge conjugates) correlations using the Lednicky–Lyuboshitz model and are compared to theoretical and other experimental results.

Category

Experiment

Collaboration (if applicable)

CMS

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