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Results of femtoscopic correlations at CMS

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Femtoscopic correlations of identified and unidentified hadrons are measured with data recorded by the CMS experiment at the LHC over a broad multiplicity range and pair transverse momentum. The first femtoscopy measurements carried in CMS for all pair combinations of K_S^0, Λ and $\overline{\Lambda}$ are reported. These identified particles are employed to perform $K_S^0 K_S^0$, $\Lambda\overline{\Lambda}$ and $K_S^0\Lambda \oplus K_S^0\overline{\Lambda}$ femtoscopic correlations in pPb collisions at $\sqrt{s_{NN}} = 8.16$ TeV, and of $\Lambda\Lambda \oplus \overline{\Lambda\Lambda}$ in PbPb collisions at $\sqrt{s_{NN}} = 5.02$ TeV, for the first time. The shape of the correlation function is observed to vary largely for different particle pair species, revealing the effect of the strong final state interaction in each case. In addition, we present results for the source radii of charged hadrons considering the Levy type source distributions in PbPb collisions at $\sqrt{s_{NN}} = 5.02$ TeV. The invariant radii results for $K_S^0 K_S^0$ in pPb and PbPb collisions show similar behavior with multiplicity and pair transverse momentum as observed for charged hadrons. The strong interaction scattering parameters, scattering length and effective range, are extracted from $\Lambda\Lambda \oplus \overline{\Lambda\Lambda}$ and $\Lambda\overline{\Lambda}$ correlations using the Lednicky-Lyuboshits model for both pPb and PbPb collisions and compared with other experimental and theoretical results.

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