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Non-identical particle femtoscopy in Pb—Pb collisions at 5.02 TeV with ALICE

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Femtoscopy is a tool that can be used to measure the space–time dimensions of the particle-emitting source created in heavy-ion collisions using two-particle correlations. Additionally to the measurement of the system size, one can extract the average pair-emission asymmetry between two particles with different masses. In this context, the measurement of femtoscopic correlations between charged pion and kaon pairs for different charge combinations obtained in Pb—Pb collisions at $\sqrt{s_{\rm NN}}$ = 5.02 TeV with ALICE at the LHC is presented. The spherical harmonics representations of the correlation functions (C_0^0 and $\Re C_1^1$) have been studied in different centrality bins. The obtained correlation functions are analysed after taking into account a precise treatment of the non-femtoscopic background. The extracted source size (R) and the pair emission asymmetry (μ) show an increase from peripheral to central events. Moreover, it is observed that pions are emitted closer to the centre of the particle-emitting system than kaons and this result is associated to the hydrodynamic evolution of the system. Also, the source radii are found to be decreasing with increasing average momentum ($k_{\rm T}$) and transverse mass ($m_{\rm T}$) of the pair which indicates the presence of strong radial flow in the system.

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