

Femtoscopy with identified charged pions in proton-lead collisions at $\sqrt{s_{\text{NN}}} = 5.02$ TeV with the ATLAS detector

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Bose-Einstein correlations between identified charged pions are measured for p +Pb collisions at $\sqrt{s_{\text{NN}}} = 5.02$ TeV with the ATLAS detector with a total integrated luminosity of 28 *nb*. Pions are identified using ionization energy loss measured in the pixel detector. Two-particle correlation functions and the extracted source radii are presented as a function of average transverse pair momentum (k_T) and rapidity (y_k^*) as well as collision centrality. Pairs are selected with a rapidity $-2 < y_k^* < 1$ and with an average transverse momentum $0.1 < k_T < 0.8$ GeV. The effect on the two-particle correlation function from jet fragmentation is studied, and a new method for constraining its contributions to the measured correlations is described. The measured source sizes are substantially larger in more central collisions and are observed to decrease with increasing pair k_T . Radii are also evaluated in intervals of y_k^* and a correlation with the local multiplicity dN/dy^* is demonstrated. The scaling of the extracted radii with the mean number of participants is also used to compare a selection of initial-geometry models.

Collaboration

ATLAS

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