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Femtoscopic measurements in p+Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV with the ATLAS detector

Tuesday, 29 September 2015 11:30 (20 minutes)

Recent measurements in two- and multi-particle correlations in p+Pb collisions suggest collective behavior reminiscent of that observed in Pb+Pb. In addition, the data hint at interesting geometric behavior in ultra-central p+Pb events, where fluctuations in the size of the proton may become significant. Femtoscopic measurements may provide useful insight on both of these problems because they image the spatio-temporal size of the particle emitting region. In particular, the evolution of HBT radii with pair momentum should have a characteristic behavior in the presence of collective expansion. This talk will present identical-pion HBT measurements from ATLAS using one- and three-dimensional correlation functions. Pions are identified using dE/dx measured in the pixel detector. Correlation functions and the resulting HBT radii will be presented as a function of pair momentum (k_T) and collision centrality. The contribution to the two-particle correlation function from hard processes is studied in depth, and a new method for completely constraining this background will be described. The measured source sizes are observed to decrease with k_T and increase significantly in more central collisions.

On behalf of collaboration:

ATLAS

Primary author: KOHLER, Markus (Weizmann Institute of Science (IL))

Presenter: KOHLER, Markus (Weizmann Institute of Science (IL))

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