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Quantum coherence measurements using two-, three-, and four-pion Bose-Einstein correlations

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"Coherence of pions in the final state is known to suppress Bose-Einstein correlations. The amount of suppression increases for higher order

correlations. We present a new method to measure the coherent fraction of pions using multi-pion Bose-Einstein correlations. The comparison of

two-, three-, and four-pion correlations allows for a more unambiguous measure of the coherent fraction.

We present the measurements in Pb-Pb collisions at sqrt(sNN) = 2.76 TeV with ALICE at the LHC.

We also show how the methodology can be extended for future measurements in smaller systems such as pp and p-Pb."

Author: GANGADHARAN, Dhevan Raja (Lawrence Berkeley National Lab. (US))

Presenter: GANGADHARAN, Dhevan Raja (Lawrence Berkeley National Lab. (US))

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