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HBT systematics from AGS to LHC

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The investigation of momentum correlations of identical bosons yields information about the spatial and temporal evolution of the particle emitting source in heavy ion collisions. A well-established technique to study space-time dimensions in such processes is the Hanbury-Brown Twiss (HBT) interferometry. Particularly interesting are the rapidity dependence of the HBT source parameters and the mean free path of pions at thermal freeze-out that can be derived from them. These parameters are studied as a function of the beam energy in search for a universal freeze-out criterion.

So far, systematic uncertainties in the AGS to SPS regime did not allow to derive satisfactory conclusions from the measured excitation function of the HBT parameters. Recently, a re-analysis of the CERES data sets for 80 and 158 AGeV, employing an improved calibration procedure of the CERES TPC, has been performed. The results will be compared to the previously published data and discussed in the context of a universal pion freeze-out scenario, which will also include predictions for the approaching experiments at the LHC.

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