

# WPCF 2023 - XVI Workshop on Particle Correlations and Femtoscopy & IV Resonance Workshop 2023



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## Two-particle Bose-Einstein correlations and their Lévy parameters in PbPb collisions at 5.02 TeV

Thursday, November 9, 2023 2:40 PM (25 minutes)

Two-particle Bose-Einstein momentum correlation functions are studied for charged-hadron pairs in lead-lead collisions at a center-of-mass energy per nucleon pair of  $\sqrt{s_{NN}} = 5.02$  TeV. The data sample, containing  $4.27 \times 10^9$  minimum bias events corresponding to an integrated luminosity of  $0.607 \text{ nb}^{-1}$ , was collected by the CMS experiment in 2018. The experimental results are discussed in terms of a Lévy-type source distribution. The parameters of this distribution are extracted as functions of particle pair average transverse mass and collision centrality. These parameters include the Lévy index or shape parameter ( $\alpha$ ), the Lévy scale parameter ( $R$ ), and the correlation strength parameter ( $\lambda$ ). The source shape, characterized by  $\alpha$ , is found to be neither Cauchy nor Gaussian, implying the need for a full Lévy analysis. Similarly to what was previously found for systems characterized by Gaussian source radii, a hydrodynamical scaling is observed for the Lévy  $R$  parameter. The  $\lambda$  parameter is studied in terms of the core-halo model.

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