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Transport theory and deblurring to Analyze Secondary Decay Emissions in Correlations measurements (online)

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Two-particle correlations play a pivotal role in understanding the space-time characteristics of particle emission in Heavy-ion collisions. These characteristics are typically represented by a relative emission source and can be obtained using transport model simulations such as the Boltzmann-Uehling-Uhlenbeck (BUU) transport model. We utilize the BUU transport model to simulate the p-p source. Subsequently, we employe the Koonin-Pratt formula to calculate the correlations. By comparing the correlations obtained from the BUU simulation with those obtained using imaging methods, such as the deblurring method, we aim to gain a deeper understanding of the impact of fast and slow emissions on the measured correlations. Specifically, this comparison is used as a tool to determine a function (tail) that represents the relative distribution of the particle pair from secondary decay emissions. Thus, we correct the BUU source function by incorporating a tail to account for the contribution of secondary decay emissions, which cannot be accurately captured by BUU simulations. Resulting source function reproduce the features in the measured correlations. To illustrate our approach, we examine p-p correlations measured in Ar + Sc reactions at E/A = 80 MeV.

Auteur principal: NZABAHIMANA, Pierre (Los Alamos National Laboratory)

Co-auteurs: VERDE, Giuseppe (L2I Toulouse, CNRS/IN2P3, UT3, INFN); Prof. DANIELEWICZ, Pawel (Michigan State University)

Orateur: NZABAHIMANA, Pierre (Los Alamos National Laboratory)