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Study of multiplicity-dependent $\rho(770)^0$ production in pp collisions at 13.6 TeV with ALICE

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Short-lived resonances provide valuable insight into the dynamics and properties of the hadron gas phase that forms after hadronization. Since the resonance lifetime is comparable to that of the hadron gas phase, their measured yields are affected by the competing rescattering and regeneration effects. These can be studied experimentally by measuring the yield ratios of resonances to their corresponding ground-state hadron as a function of the charged-particle multiplicity, which serves as a proxy for the system size. In this context, the $\rho(770)^0$ resonance is particularly interesting due to its very short lifetime of about 1.3 fm/c for the study in small collision systems, corresponding to a very short duration of the hadron gas phase. This study serves as a reference for measurements in heavy-ion collisions. This contribution presents the study of the $\rho(770)^0$ production in pp collisions at 13.6 TeV with the ALICE detector as a function of multiplicity. The results are compared with existing measurements from other collision energies and discussed within the framework of state-of-the-art phenomenological models describing particle production at LHC energies.

Author: LIM, Hyunji (Pusan National University (KR))

Presenter: LIM, Hyunji (Pusan National University (KR))

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