Contribution ID : 63

Surprising similarities between the high transverse momentum spectra in pp and Pb-Pb collisions

Abstract

We study the particle production at high transverse momentum ($p_{\rm T} < 8$ GeV/c) in both pp and Pb-Pb collisions at the LHC energies. The $p_{\rm T}$ distributions of charged particles in pp collisions are know to obey the so-called $x_{\rm T}$ -scaling which is a feature of pQCD hard processes. Therefore, the characterisation of the spectra is done using a power-law function and the resulting power-law exponent (n) is studied as a function of $x_{\rm T}$ for minimum-bias pp collisions at different \sqrt{s} . The function form of n as a function of $x_{\rm T}$ exhibit an universal behavior. PYTHIA 8.212 reproduces the scaling properties and therefore, it is used to study the multiplicity dependent particle production. Going from low to high multiplicities, the power-law exponent decreases. A similar behavior is also observed in heavy-ion collisions when one studies the centrality (multiplicity) dependent particle production. The values of the exponents in pp and Pb-Pb collisions are rather similar. These results suggest that the nature of high $p_{\rm T}$ particles in small and large systems could have the same origin. And therefore, for a correct interpretation of heavy-ion results in terms of the nuclear modification factor this similarity should be understood.

Primary author(s) : Dr. MISHRA, Aditya Nath (ICN-UNAM)

Co-author(s) : Dr. ORTIZ VELASQUEZ, Antonio (ICN, UNAM); Dr. PAIC, Guy (Instituto de Ciencias Nucleares UNAM)

Presenter(s) : Dr. MISHRA, Aditya Nath (ICN-UNAM)