

The 124th HENPIC seminar by Prof. Jun Song 宋军 (Jining U.), Oct. 15, 2020, Thursday, 10:30 am (UTC+8)

Talk title: Hadron production by equal-velocity quark combination mechanism in high energy collisions

Speaker: Prof. Jun Song (Jining University)

Abstract: Hadronization is the process of the formation of hadrons out of final state quarks and gluons in high energy reactions. Because QCD dynamics of the hadronization are not yet fully understood, hadronization is modeled and parameterized in various phenomenological studies closely interacting with experimental data of high energy reactions. In recent works, we found that experimental data for transverse momentum (p_T) spectra of hadrons in high multiplicity events of $\sqrt{s_{NN}} = 2.76$ and 2.76 Pb collisions at LHC energies exhibit a quark number scaling (QNS) property. This QNS is the direct consequence of combination hadronization of quarks and antiquarks with equal velocity (EVC). We found that EVC of light-flavor quarks as well as charm quarks can self-consistently describe the p_T spectra of light-flavor hadrons and those of single-charmed hadrons in $\sqrt{s_{NN}} = 2.76$ and 2.76 Pb collisions at LHC. Furthermore, we applied EVC to heavy-ion collisions at RHIC and LHC. We found that experimental data of hadronic elliptic flow can be understood in an amazingly simple way under EVC mechanism. We made a full energy-scan study for hadronic p_T spectra and yield densities at midrapidity in Au+Au collisions at collision energy of 7.7–200 GeV to systematically test EVC mechanism.

Self-introduction: Jun Song, currently a professor at Jining University, obtained his Ph.D from Shandong University in 2011. His research focuses on the hadron production phenomenology in high energy collisions.

Presenter: Prof. SONG, Jun (Jining University)