

The 155th HENPIC seminar by Dr. Song Zhang, Fudan Uni., Dec. 23rd, 2021, Thursday, 10:30am (Beijing time)

Title: α -cluster structure influence in relativistic heavy-ion collisions

Abstract: Relativistic heavy-ion collisions aim at searching for the quark-gluon plasma (QGP) and investigating its properties. Collective flow is one of the excellent probes of QGP and many observables in the collisions are constructed based on the collective flow itself or the flow analysis method. The influence from nuclear structure is important for understanding how the initial geometry asymmetry transfers to the final state momentum space. α -clustered nuclei with intrinsic geometry shape is one of the main sources of the initial geometry properties in the collisions. Recently we employed a multi-phase transport model to simulate the relativistic heavy-ion collisions involving the α -clustered ^{12}C and ^{16}O at RHIC and LHC energies. By analyzing the simulated events, collective flow, multiplicity correlation and distinguishing the structure by a classifier of machine learning model are investigated. Comparing results among different configurations of the nuclear structure, new observables are proposed as sensitive probes to distinguish the exotic nuclear structure in heavy-ion collisions.

About the speaker: Dr. Song Zhang received his B.S. degree at Hebei Uni. in 2001 and PhD degree at Shanghai Institute of Applied Physics in 2009 (Supervisor Prof. Yu-Gang Ma.) Dr. Zhang is a member of the RHIC-STAR and CERN-ALICE Col, with research interest in the particle correlation, collective flow, coalescence mechanism in relativistic heavy-ion collisions from large system to small system. Recently he also pays more attention to the initial state involving the influence from the α -clustered nuclei structure in relativistic heavy-ion collisions.