

Charmonium as a probe of hot quark matter in nuclear collisions in ALICE at the LHC

Friday 14 January 2022 16:30 (10 minutes)

At extremely high temperatures and densities, hadronic matter undergoes a phase transition to a state of deconfined quarks and gluons known as quark-gluon plasma (QGP). It is believed that our universe had been in such deconfined state just after the big bang when the temperature was of the order of several thousand billion degrees. Such state of matter might be also present in the inner core of Neutron Stars (NSs), where nuclear matter can reach extremely high densities. Ultrarelativistic nuclear collisions offer an opportunity to study the properties of QGP by achieving such extreme conditions in the laboratory. Charmonia, bound states of charm and anti-charm quarks, serve as an efficient probe of the QGP in nuclear collisions.

In this contribution, recent charmonium measurements performed by the ALICE collaboration in Pb–Pb collisions, will be shown. In particular, observables that are especially sensitive to the properties of the QGP, such as nuclear modification factors (RAA) and elliptic flow (v_2) of inclusive J/ψ meson in Pb–Pb collisions at collision energy of 5.02 TeV, will be presented. The comparison of results with available theoretical model calculations will also be discussed.

Presenter: SHARMA, Himanshu (Institute of Nuclear Physics, PAN)

Session Classification: Young Scientists' Session