Contribution ID: **26** Type: **not specified**

Investigating the J/Psi flow

Friday 26 March 2021 11:15 (15 minutes)

The quark-gluon plasma (QGP) is a strongly-interacting deconfined state of matter produced in ultra-relativistic heavy-ion collisions. In order to study the QCD matter phase of its evolution, quarkonia, bound states of a heavy quark and antiquark pair, are preferred tools as they are sensitive to the first stages of the collision and to the evolution of the created system.

Measurements of the azimuthal anisotropies (expressed as elliptic and triangular flows, v_2 and v_3 respectively) shed a light on collective behaviors of the particles within this hot and dense medium. For the J/ψ, the regeneration of charm quarks and geometrical anisotropies typically result in a non-zero v_2 while fluctuations in the medium are related to the v_3.
Measuring the azimuthal anisotropies of these hard probes gives us information regarding their own production mechanisms, and the formation of the QGP.

In this contribution, I review the results regarding the J/ψ flow, from the first measurements at RHIC in Au-Au collisions at $\sqrt{s_{NN}} = 200$ GeV, to the most recent ones provided by the LHC collaborations. Part of the measurements concern Pb-Pb collisions (up to $\sqrt{s_{NN}} = 5.02$ TeV) in which the J/ψ exhibits a significant non-zero v_2 in a wide centrality and p_T range as well as a significant non-zero v_3. Other measurements focus on smaller systems like p-Pb. The p-Pb system, which is typically used as a standard candle for CNM effects in Pb-Pb, does display a non-zero v_2 for $3 < p_T < 6$ GeV/c whose magnitude is even comparable to the one from Pb-Pb collisions. The smallest hadronic system p-p is also being investigated. Proof of the J/ψ flow in p-p would make a compelling case for collectivity in small systems.

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Session Classification: Day 5 (mostky HIC, nPDFs & tools)

Track Classification: Reactions with 2 nuclei & tools for Quark-Gluon Plasma,...