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Quarkonium production and collectivity in heavy-ion collisions with ALICE

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Quarkonium production has long been identified as one of the golden probes to study the quark-gluon plasma (QGP). In fact, the early production of heavy quarks ($c\bar{c}$ and $b\bar{b}$) makes charmonia an ideal tool to investigate the evolution of the hot and dense medium produced in ultra-relativistic heavy-ion collisions. On the one hand, the production measurements and the ground-to-excited states ratios become more and more relevant to discriminate among the scenarios foreseen by the different theoretical models. On the other hand, the measurement of azimuthal anisotropies in quarkonium production has a special role to shed light on the collective behavior of particles in a strongly interacting medium. In this contribution, the first preliminary measurement of the $\psi(2S)$ -to-J/ ψ ratio obtained with the new data sample collected in Pb–Pb collisions at $\sqrt{s_{\rm NN}} = 5.36$ TeV will be presented together with new results on J/ ψ and $\Upsilon(1S) v_2$. In particular, the J/ ψ measurements will be show using the event-plane, scalar product and multi-particle cumulant (v_2 {2} and v_2 {4}) which allows further insight into charm quark thermalization into the QGP and, for the first time, access to flow fluctuations.

Secondary track

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