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Recent ALICE results on quarkonium

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ALICE (A Large Ion Collider Experiment) at the LHC aims at investigating the hot and dense QCD matter formed in ultra-relativistic heavy-ion collisions, and the transition to the Quark-Gluon Plasma (QGP). The suppression of charmonium and bottomonium states by color screening, and its hierarchy resulting from differences in binding energy, is a signature of QGP formation. Moreover, early ALICE results on J/ψ production in Pb-Pb collisions at the LHC were found to be compatible with a scenario where charmonium regeneration occurs in the hadronization phase or at the phase boundary. More recently, it was shown how measurements of quarkonium azimuthal anisotropies and polarization can provide insights into the properties of deconfined nuclear matter. Quarkonium photoproduction in peripheral and ultra-peripheral heavy-ion collisions provides a powerful tool to investigate the gluon structure of the colliding nuclei. Measurements of quarkonium production in small systems, such as proton-proton and proton-nucleus collisions, are also part of the ALICE physics program as they help constrain production models and cold-nuclear matter effects. Measurements as a function of the event multiplicity are particularly interesting, as they probe the interplay between hard and soft particle production and enable the investigation of a potential common origin for observations made in small and large (such as Pb-Pb) systems. The recent ALICE results on quarkonium, exploiting the full data sample from the LHC Run 2, will be reviewed. The status and first results from the ongoing Run 3 data-taking with an upgraded apparatus will also be discussed.

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