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Quarkonium production in proton-proton and proton-lead collisions with ATLAS at the LHC

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The suppression of heavy quarkonium states such as J/ψ , $\psi(2S)$ and $\Upsilon(nS)$ in heavy-ion collisions, with respect to proton-proton collisions, plays an important role in studying the hot and dense medium formed in the larger collision systems. A full assessment of this suppression requires understanding of nuclear effects which may affect the production of quarkonium states even in the absence of the medium. The study of quarkonium production in proton-nucleus collisions serves as a baseline for understanding heavy-ion collisions and furthers our knowledge of such nuclear effects. Using proton-lead and proton-proton collision data collected at the LHC in 2013, the ATLAS experiment measures J/ψ , $\psi(2S)$ and $\Upsilon(nS)$ production. The yields of charmonium states are separated into contributions from b-hadron decays and prompt production. The nuclear modification factors and excited-to-ground state ratios are presented. All quarkonium states are reconstructed via the dimuon decay channel and the yields are shown differentially in intervals of transverse momentum, rapidity and event activity.

On behalf of collaboration:

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