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Production of charmonium(-like) and their bottomonium counterparts at ATLAS

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A precise understanding of the relative contributions to Charmonium production from prompt and non-prompt production modes is necessary in order to better understand the various charmonium production modes and their properties. We present new, double-differential production cross-section measurements of the J/ψ , $\psi(2S)$ and $X(3872)$ charmonium states, extending into new kinematic environments with high precision. The results are presented separately for prompt and non-prompt production modes, and relative production rates for $\psi(2S)$ to J/ψ are also presented. The fractions of J/ψ and $\psi(2S)$ that are produced from the decay of a B hadron are also measured in fine p_T and rapidity intervals over the ATLAS acceptance region, which will provide important input to modelling of heavy flavour production for future measurements. Results compared with the latest theoretical calculations and models. The existence of the $X(3872)$ suggests the presence of bottomonium counterpart. Search for X_b in the final state of $Upsilon \pi \pi$ is presented.

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