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【323】Measurement of the prompt χ_c1 and χ_c2 polarizations at CMS

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The process of hadron formation via the strong force is not yet fully understood. Quarkonia, bound states of a heavy quark and its anti-quark are ideal probes to study this process. Theoretically the production of quarkonia can be described by the Non-Relativistic Quantum Chromodynamics (NRQCD) framework. The factorization approach that is employed by the framework relies on experimental inputs like quarkonium production cross sections and polarization measurements. The LHC experiments have published a multitude of quarkonium cross section and polarization measurements. However, these measurements mainly cover the S-wave states and measurements for the P-wave states remain scarce. We present the first measurement of P-wave state polarization, namely the polarization of the prompt χ_c1 and χ_c2 mesons, using data that has been collected in 2012 by the CMS experiment at the LHC in proton-proton collisions at $\sqrt{s}$ = 8 TeV. We find that the two states have significantly different polarizations, in agreement with NRQCD predictions. We also briefly discuss global fit efforts that make use of these new measurements.

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