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Observation of Υ(1S) pair production in proton-proton collisions at √s=8 TeV (Article)

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Abstract

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Pair production of Υ(1S) mesons is observed at the LHC in proton-proton collisions at s=8 TeV by the CMS experiment in a data sample corresponding to an integrated luminosity of 20.7 fb^{-1}. Both Υ(1S) candidates are fully reconstructed via their decays to $\mu^+\mu^-$. The fiducial acceptance region is defined by an absolute Υ(1S) rapidity smaller than 2.0. The fiducial cross section for the production of Υ(1S) pairs, assuming that both mesons decay isotropically, is measured to be 68.8±12.7 (stat)±7.4 (syst)±2.8 ($\mathcal{B}$) pb, where the third uncertainty comes from the uncertainty in the branching fraction of Υ(1S) decays to $\mu^+\mu^-$. Assuming instead that the Υ(1S) mesons are produced with different polarizations leads to variations in the measured cross section in the range from –38% to +36%.

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