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## Measurements of $Y(nS)$ polarization with the CMS experiment

*Saturday, July 7, 2012 2:45 PM (15 minutes)*

The polarizations of the Upsilon(1S), Upsilon(2S) and Upsilon(3S) mesons produced in proton-proton collisions at  $\sqrt{s} = 7$  TeV are measured using a data sample collected with the CMS detector at the LHC, corresponding to an integrated luminosity of around  $5 \text{ fb}^{-1}$ . The measurements are based on the analysis of the dimuon decay angular distributions, analyzed in three different polarization frames, and are presented as a function of the Upsilon transverse momentum, in two rapidity ranges. The measurement of the polarization parameters,  $\lambda_{\theta}$ ,  $\lambda_{\phi}$  and  $\lambda_{\theta\phi}$  is complemented by the determination of the frame-invariant quantity  $\lambda_{\tilde{}}$ , which provides a very useful intrinsic test of the reliability of the whole analysis chain and supplementary physical information.

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