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## Hadroproduction of $\Upsilon(nS)$ above the $B\bar{B}$ threshold and implications for $Y_b(10890)$

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Based on the non-relativistic QCD factorization scheme, we study the hadroproduction of the bottomonium states  $Y(5S)$  and  $Y(6S)$ . We argue to search for them in the final states  $Y(1S,2S,3S)\pi^+\pi^-$ , which are found to have anomalously large production rates at  $Y(5S)$ . The enhanced rates for the dipionic transitions in the  $Y(5S)$ -energy region could, besides  $Y(5S)$ , be ascribed to  $Y_b(10890)$ , a state reported by the Belle collaboration, which may be interpreted as a tetraquark. The LHC/Tevatron measurements are capable of making a case in favor of or against the existence of  $Y_b(10890)$ , as demonstrated here. Dalitz analysis of the  $Y(1S,2S,3S)\pi^+\pi^-$  states from the  $Y(5S)/Y_b(10890)$  decays also impacts directly on the interpretation of the charged bottomonium-like states,  $Z_b(10600)$  and  $Z_b(10650)$ , discovered by Belle in these puzzling decays.

### Summary

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