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Higgs Boson Production with a Single Bottom Quark at Hadron Colliders CHRISTOPHER JACKSON, LAURA REINA, Florida State University, SALLY DAWSON, BNL, DOREEN WACKEROTH, SUNY at Buffalo — Recently, the production of Higgs bosons with bottom quarks has received much interest from both the theoretical and experimental communities. This interest is due to the fact that, for large values of $\tan\beta$, bh production is expected to be a viable discovery mode for supersymmetric Higgs bosons at present and future colliders. Currently, there are two approaches to calculating the theoretical prediction of bh production. In the *five-flavor-number scheme*, potentially large logarithms, which arise from collinear $g\bar{b}$ splitting, can be resummed by a bottom quark Parton Distribution Function. Alternatively, in the *four-flavor-number scheme*, one can compute the cross section for $p\bar{p}, pp \to bh$ at fixed order in QCD without resumming higher order collinear logarithms. The bh production mode is actively being searched for at the Tevatron, by both D0 and CDF collaborations, and, thus, precise predictions for total and differential cross sections are imperative. We have calculated the cross section for $p\bar{p}, pp \to bh$ at next-to-leading order (NLO) in QCD using the four-flavor-number scheme and present our results for the total cross section and distributions. We also compare our fixed-order results for the cross section and distributions with those of the resummed calculation using the five-flavor-number scheme and show that the NLO cross sections calculated in the two schemes are compatible within the theoretical uncertainty.

Christopher Jackson
Florida State University

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