



FIG. 7: Lowest order and NLO QCD results for $p\bar{p} \rightarrow b(\bar{b})HX$ at the Tevatron with $\sqrt{s} = 1.96 \text{ TeV}$ with $\sqrt{s} = 1.96 \text{ GeV}$, $p_T^b > 20 \text{ GeV}$, $|\eta_b| < 2$, and $\Delta R > .4$. The renormalization/factorization scales are set equal to μ .

III. RESULTS

A. Numerical Results

For our numerical studies, we use the following inputs:

$$\begin{aligned}
 \alpha &= 1/137.03599911 \\
 G_\mu &= 1.16637 \times 10^{-5} \text{ GeV}^{-2} \\
 M_Z &= 91.1875 \text{ GeV} \\
 M_t &= 173.1 \text{ GeV}.
 \end{aligned} \tag{32}$$

We set the CKM mixing matrix to unity. For the pole mass of the b quark, we take $M_b = 4.25 \text{ GeV}$. We use CTEQ6.6 PDFs[47] and vary the renormalization/factorization scales $\mu = \mu_R = \mu_F$ from $M_H/2$ to $2M_H$ in the total cross section results.

Our results are expressed as,

$$\sigma(bg \rightarrow bH)_{NLO}(\mu) = \sigma(bg \rightarrow bH)_0(\mu) \left(1 + \Delta_{QCD}(\mu) + \Delta_{QED}(\mu) + \Delta_{WK}(\mu) \right), \tag{33}$$