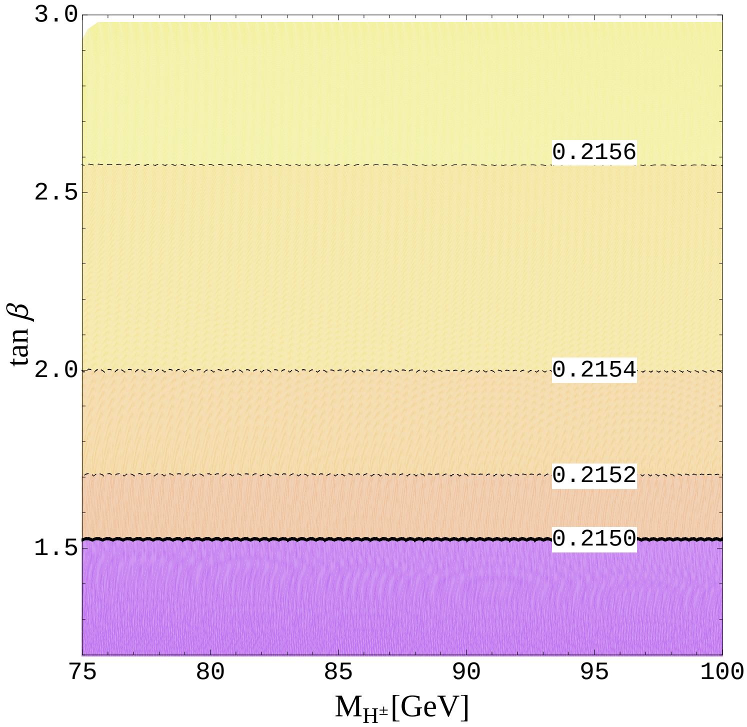

FIG. 4: R_b^{BMSSM} values from loop correction of charged Higgs and SUSY. $m_{\tilde{q}_3} = m_{\tilde{t}} = 190$GeV, $A_t = \mu = 200$GeV. This is calculated by our own code using formulae of [25].

and measured A^b_{FB} becomes

$$A^b_{\mathrm{FB}} = \frac{\sigma_F - \sigma_B}{\sigma_F + \sigma_B + \sigma_{fake}}. \tag{13}$$

Because Higgs is a scalar particle, it evenly contributes to σ_F and σ_B, so it decreases A^b_{FB}. BMSSM has a parameter space such that prediction of R_b is sufficiently smaller than R_b^{SM} so σ_{fake} (R_b^{fake}) can be large enough, a sizable loop correction to g_R^b is not required.

However, it is not clear how many of the events will be included in data set for A^b_{FB}. To measure A^b_{FB}, the direction of bottom quarks is required. Events which contain hard initial state radiation(ISR) photons or final state radiation(FSR) gluons should be removed because it disturbs the direction of beam or bottom quarks. For example, OPAL uses combination of sphericity([22]), total energy, energy imbalance along the beam direction([23]) and so on, to select such hadronic decay events. In $Z \to hA \to 2b(2\tau \ \text{ or } \ c\bar{c})$ events, angle between $\tau(c)$ and b can be large because two jets are loosely correlated. In this case, tau jets can look like hard gluon jets from b-quarks, so it might be rejected by the selection cut of A^b_{FB}.

To make the discussion simple, we assume $\mathrm{Br}(h \to b\bar{b}) = 1$ and $\mathrm{Br}(A \to \tau^+\tau^-) = 1$. Also