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Higgs from the Top

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In light of the discovery of a Standard Model (SM)-like Higgs boson, h, at the LHC, we investigate the rare decay of the top quark t \rightarrow W bh. We find its decay branching fraction to be 1.80 × 10–9 and is several orders of magnitude larger than the loop-induced t \rightarrow qh transition. We extend the calculation to t \rightarrow W bH, where H represents the two CP-even and single CP-odd Higgs bosons, respectively H1 , H2 and A0 , in the Type II Two Higgs Doublet Model [2HDM(II)]. In the

SM Higgs boson scenario, we find that the decay rate is quite sensitive to anomalous tth couplings. In the 2HDM(II) scenario, the rates for H1 , H2 , and A0 vary vastly over the still-allowed range of

 $\tan \beta$ and scalar masses, relative to the rate for a SM Higgs boson. We also report sensitivity to both a light SM-unlike Higgs boson and a light CP-odd Higgs boson.

Author: RUIZ, Richard (University of Pittsburgh)
Co-author: HAN, Tao (University of Pittsburgh)
Presenter: RUIZ, Richard (University of Pittsburgh)
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