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Flavor violating decays of the Neutral Higgs bosons at the LHC

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The next step in understanding the mechanism behind electroweak symmetry breaking is to look for signs of a second Higgs doublet which is required by some of the well motivated extensions of the Standard Model. In a general two Higgs doublet model (2HDM) there are flavor changing neutral currents at tree level. Experimental results limit the size of these off-diagonal Yukawa couplings but λ_{tc} is not strongly constrained by data. Coupling measurements of the 126 GeV Higgs boson point towards the “alignment” limit where the gauge boson and diagonal fermion couplings of the light neutral Higgs state approach the SM values. In this limit flavor changing couplings of the light neutral Higgs are naturally suppressed by a small $\cos(\beta - \alpha)$ while the off-diagonal couplings of the heavier neutral Higgs bosons are not. We study the prospects of observing the flavor changing decays of the heavier neutral Higgs bosons ($H, A \rightarrow t\bar{c} + \bar{t}c$) at the LHC in a general 2HDM.

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