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## Top Decays with Flavor Changing Neutral Higgs Interactions at the LHC

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### Abstract:

We investigate the prospects for the discovery of a top quark decaying into one light Higgs boson along with a charm quark in top quark pair production at the CERN Large Hadron Collider (LHC).

A general two Higgs doublet model is adopted to study the signature of flavor changing neutral Higgs interactions for  $t \rightarrow c\phi^0$  or  $\bar{t} \rightarrow \bar{c}\phi^0$  where  $\phi^0$  is a CP-even scalar ( $H^0$ ) or a CP-odd pseudoscalar ( $A^0$ ).

The dominant physics background is evaluated with realistic acceptance cuts as well as tagging and mistagging efficiencies.

We have found abundant signal events and that our acceptance cuts reduce the physics background enough to establish a  $5\sigma$  signal for  $M_\phi$

at 130 GeV at the early stage of LHC with  $\sqrt{s} = 7$  TeV and an integrated luminosity of  $10 \text{ fb}^{-1}$ .

The discovery potential will be greatly enhanced with the full energy of  $\sqrt{s} = 14$  TeV.

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