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Flavor Changing Neutral Higgs Bosons Meet the Top and the Tau at Hadron Colliders

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A general two Higgs doublet model is employed to study flavor changing
neutral Higgs (FCNH) interactions in pp collisions.
We investigate the discovery potential of
(a) a flavor changing neutral Higgs boson decays into leptons,
$pp \to \phi^0 \to \tau^\mp \mu^\pm + X$ from gluon fusion, and
(b) production of a flavor changing neutral Higgs boson associated with a top quark $pp \to t\phi^0 + X$, where ϕ^0 could be a CP-even scalar (h^0, H^0) or a CP-odd pseudoscalar (A^0).
The light Higgs boson h^0 is found to resemble closely the standard Higgs boson at the Large Hadron Collider (LHC). In the alignment limit of $\cos(\beta - \alpha) \simeq 0$, for h^0–H^0 mixing, FCNH couplings of h^0 are naturally suppressed, but such couplings of the heavier H^0, A^0 are sustained by $\sin(\beta - \alpha) \simeq 1$.
We evaluate physics backgrounds from dominant processes
with realistic acceptance cuts and tagging efficiencies.
We find promising results for the LHC with $\sqrt{s} = 14$ TeV,
and future pp colliders with $\sqrt{s} = 27$ TeV and 100 TeV

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