Leptonic flavor violation in the Higgs sector at the LHC

BRENT MCCOY, CHUNG KAO, University of Oklahoma, WEI-SHU HOU, National Taiwan University, MASAYA KOHDA, Nagoya University, AMARJIT SONI, Brookhaven National Lab — We present the discovery potential of \( pp \rightarrow \phi^0 \rightarrow \tau \mu + X \) at the Large Hadron Collider (LHC), with \( \phi^0 = h^0, H^0, A^0 \). We choose a general Two Higgs Doublet Model (2HDM) with non-negligible flavor changing couplings in the hadronic sector, in which \( \phi^0 \) couples to \( tc \). Current data favors the alignment limit of a 2HDM where \( \sin(\beta - \alpha) \approx 1 \), which can enhance leptonic couplings to the light Higgs boson and might provide an observable flavor changing cross-section in that sector. We study the \( \phi^0 \rightarrow \tau \mu \) channel for a range of \( \cos(\beta - \alpha) \) and \( \rho_{\tau\mu} \) values that can be consistent with the CMS excess in Run-1 and account for dominant physics background with realistic acceptance cuts at \( \sqrt{s} = 13 \) TeV and 14 TeV.

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