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Higgs $\rightarrow \mu\tau$ as an indication for S_4 flavor symmetry

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Lepton flavor violating Higgs decays can arise in flavor symmetry models where the Higgs sector is responsible for both the electroweak and the flavor symmetry breaking. Here we advocate a minimal S_4 Three-Higgs-Doublet-Model with Lepton Flavor Triality. This model can explain the 2.5σ excess of Higgs decay final states with a $\mu\tau$ topology reported recently by CMS if the Standard Model like Higgs and the new neutral Higgs bosons are almost degenerate in mass. The model predicts sizable rates for lepton flavor violating Higgs decays also in the $e\tau$ and $e\mu$ channels, while flavor violating lepton decays are suppressed as a consequence of Lepton Flavor Triality.

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