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Lepton Flavour Violating Higgs decays at the Compact Linear Collider (CLIC) and Future Colliders

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This talk provides an update on the current status of future collider projects, like the Compact Linear Collider (CLIC), the Future Circular Collider (FCC). It briefly outlines their progress and ongoing developments, while also addressing the European Strategy for Particle Physics recommendations.

In this context, Lepton flavour violating Higgs decays could appear in models beyond the Standard model of particle physics. In this talk I will present a sensitivity study of the Compact Linear Collider (CLIC) for this processes where the final states can be electron-muon pairs, tau-muon pairs or tau-electron pairs. Limits at 95% CL on the branching ratios of these processes were calculated at 2.5 ab^{-1} of data at $\sqrt{s} = 1.4 \text{ TeV}$ and $\sqrt{s} = 3 \text{ TeV}$. We obtained $BR(H \rightarrow e\mu) < 7.2 \times 10^{-3}\%$, $BR(H \rightarrow \tau\mu) < 0.024\%$ and $BR(H \rightarrow e\tau) < 0.036\%$ for $\sqrt{s} = 1.4 \text{ TeV}$, and, $BR(H \rightarrow e\mu) < 0.8 \times 10^{-3}\%$, $BR(H \rightarrow \tau\mu) < 0.007\%$ and $BR(H \rightarrow e\tau) < 0.019\%$ for $\sqrt{s} = 3 \text{ TeV}$.

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