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A review of $\mu \rightarrow 3e$, $\mu \rightarrow e$ gamma and $\mu \rightarrow e$ conversions

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The observation of lepton flavour violation (LFV) in interactions involving charged leptons would be an unambiguous sign of physics beyond the Standard Model of particle physics. Given that muons can be produced at high intensities, searches for LFV with muons are particularly sensitive.

In a global initiative, ongoing and upcoming experiments are aiming to discover physics beyond the Standard Model in the three golden muon LFV channels: $\mu \rightarrow e\gamma$, $\mu \rightarrow eee$ and $\mu \rightarrow e$ conversion on nuclei. With innovative detector concepts and new muon beam lines, these experiments will be able to investigate muon LFV with sensitivities improved by up to four orders of magnitude compared to past searches in the coming years.

In this talk, the current status of muon LFV searches will be discussed and the ongoing MEG II and DeeMe experiments as well as the upcoming Mu2e, COMET and Mu3e experiments will be presented.

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