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Probing Lepton Flavor Violation in Meson Decays with LHC Data (10'+3')

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In this letter, we use LHC data from the Drell-Yan processes $pp \to \ell_i \ell_j$ (with $i \neq j$) to derive model-independent upper limits on lepton-flavor-violating meson decays. Our analysis is based on an Effective Field Theory (EFT) approach and it does not require a specific assumption regarding the basis of effective operators. We find that current LHC data (140 fb^{-1}) already provides competitive limits on $\mathcal{B}(B \to \pi e \tau)$ and $\mathcal{B}(B \to \pi \mu \tau)$ with respect to the ones obtained through experimental searches at the B-factories. Moreover, we derive upper limits on several decays that have not been searched for experimentally yet, such as $D^0 \to e\tau$ in the charm sector, and various semileptonic decays such as $B \to \rho \mu \tau$, $B_s \to K \mu \tau$ and $B_s \to \phi \mu \tau$. Lastly, we discuss the validity of the EFT description of LHC data and the impact of loop corrections in our analysis.

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