



Contribution ID: 24

Type: **not specified**

Future lepton beam dumps constraint on light bosons with lepton flavor violating couplings

Monday 1 July 2024 17:20 (20 minutes)

We consider charged lepton flavor violation (CLFV) via a light and weakly interacting boson and discuss the detectability by future lepton beam dump experiments. We focus on three types of CLFV interactions, i.e., the scalar-, pseudoscalar-, and vector-type interactions, and calculate the sensitivities of lepton beam dumps to each CLFV interaction. We show that a wide region of the parameter space can be explored. Particularly, it is found that future lepton beam dump experiments have sensitivities to very small coupling regions in which the rare muon decays, such as $\mu \rightarrow e\gamma$, cannot place bounds, and that there is a possibility to detect CLFV decays of the new light bosons.

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Session Classification: Theory and phenomenology