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Searching for Heavy Leptophilic Z' at Future Muon Collider

We study the phenomenology of leptophilic Z' gauge bosons at the future muon collider. The leptophilic Z' model, although well-motivated, remains largely unconstrained from current low-energy and collider searches for Z' masses above $calO(100\,\mathrm{GeV})$, thus providing a unique opportunity for future lepton colliders. Taking $U(1)_{L_\mu - L_\tau}$ models as concrete examples, we show that future muon collider with multi-TeV center-of-mass energies provide unprecedented sensitivity to heavy leptophilic Z' bosons.

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