

The search for Leptophilic dark matter and $(g-2)_\mu$ at future lepton colliders

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We consider the renormalizable leptophilic WIMP models with the scalar mediators which have lepton numbers. We perform a comprehensive analysis for such a WIMP scenario for two distinct cases with SU(2) doublet or singlet mediators considering all the relevant theoretical, cosmological and experimental constraints at present. We show that mono-photon search at ILC experiment can play a significant role to probe the yet unexplored parameter region. Furthermore, we discuss the capability of explaining the muon $g-2$ anomaly by combined model scenario including both the doublet and singlet mediators.

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