

## Gauged Lepton Number and Implications for Collider Physics

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Lepton number has a deep connection with the neutrino mass generation. A new minimal anomaly-free gauged  $U(1)_l$  lepton-number model, with four exotic chiral leptons, is studied. Motivated by phenomenology, we discuss a simplified case which has the universal Yukawa couplings. It agrees with all the experimental constraints and predicts  $m_e, m_\mu \ll m_\tau$ , and the latter is of the electroweak scale. Due to the interference between the SM and  $U(1)_l$  gauge interactions, this model robustly predicts that  $e, \mu, \tau$  have distinctive forward-backward asymmetries at the  $e^+e^-$  colliders. It can be searched for at the  $e^+e^-$  machine with  $\sim$  TeV center-of-mass energy and an integrated luminosity  $\sim ab^{-1}$ .

**Primary author:** Prof. CHANG, We-Fu (National Tsing Hua University)

**Co-author:** Prof. NG, John (TRIUMF)

**Presenter:** Prof. CHANG, We-Fu (National Tsing Hua University)

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