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Lepton Flavor and Number Violation in Left Right Models

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If the Left-Right Symmetric Model (LRM) realized at the TeV scale provides the correct explanation of the diboson excess observed at the 8 TeV LHC by ATLAS and CMS, then there are numerous implications for physics at lower energy scales involving many aspects of the leptonic sector. These include lepton number-violating processes such as $\beta\beta_{0\nu}$, lepton flavor-violating (LFV) processes, such as $\mu \rightarrow 3e$, $\mu \rightarrow e\gamma$ and $\mu \rightarrow e$ conversion, as well as lepton number-conserving processes, such as $M\{o\}$ ller scattering, the $g - 2$ of the muon and μ decay itself. To explore these numerous implications we have performed a detailed examination of the relevant parameter space of the LRM to ascertain the capabilities of these various processes to probe this space and the complementarity among them. We find that future measurements of both $\mu \rightarrow e$ conversion and $\mu \rightarrow 3e$ will be particularly valuable in this regard. Even if the connection to the diboson excess is surrendered we find that the important complementarity of these multiple probes of the LRM leptonic sector is maintained.

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