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Effects of the Left-Right Asymmetry Parameter in the End Point of the Tritium-Beta Spectrum

A. GUTIÉRREZ-RODRÍGUEZ^{1,a}, M. A. HERNÁNDEZ-RUIZ^{2,a}, F. RAMÍREZ-SÁNCHEZ¹

¹Facultad de Física, Universidad Autónoma de Zacatecas
Apartado Postal C-580, 98060 Zacatecas, Zacatecas-MÉXICO
e-mail: alexgu@planck.reduaz.mx

²Facultad de Ciencias Químicas, Universidad Autónoma de Zacatecas
Apartado Postal 585, 98060 Zacatecas, Zacatecas-MÉXICO

^aCuerpo Académico de Partículas, Campos y Astrofísica

 [Keywords](#)
 [Authors](#)



phys@tubitak.gov.tr

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Abstract: We start with a Left-Right Symmetric Model and we analyze the endpoint of the beta decay of tritium ${}^3\text{H} \rightarrow {}^3\text{He} + e^- + \bar{\nu}_e$. We applied this model to incorporate the right currents, whereby we propose an amplitude whose leptonic part contains the parameter ϵ defined as a left-right asymmetry parameter which measures the parity violation. We realized a numerical computation for the sensibility of the Mainz and Troitsk experiments for $m_{\nu_e} = 2.2$ eV; and for the future beta decay experiment KATRIN, which will reach a sensitivity of $m_{\nu_e} \approx 0.2$ eV. We find that the electron energy spectrum for such experiments is light affected by the left-right asymmetry parameter.

Key Words: Models beyond the standard model, Neutrino mass and mixing, Beta decay. Models beyond the standard model, Neutrino mass and mixing, Beta decay.

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