Contribution ID: **78** Type: **Poster**

Heavy Neutrino Production and Lepton Flavor Violation at Future e+e– Colliders in a Non-Universal U(1)' Model

Heavy neutral leptons (HNLs) predicted by low-scale inverse seesaw models are a prime target for future lepton colliders. We study the associated production $e^+e^- \to \nu_e N_1$ in a non-universal $U(1)'$ extension of the Standard Model that implements the inverse seesaw mechanism. We derive the complete tree-level analytical cross section, including the s-channel Z and t-channel W contributions and their interference, and implement the model independently in LanHEP/CalcHEP. Using benchmark scenarios for CLIC ($\sqrt{s} = 380$ GeV, $\mathcal{L} = 1$ ab^{-1}) and ILC ($\sqrt{s} = 500$ GeV, $\mathcal{L} = 0.5$ ab^{-1}), we analyze the cross section as a function of the HNL mass (25–500 GeV) and of the active–sterile mixing $|U_{N_1}|^2$, together with kinematic distributions and expected event yields. For the $\nu_e\bar{\nu}_e e^+e^-$ final state, we compare the signal with the irreducible SM background after basic acceptance cuts ($p_T > 10$ GeV, $|\eta| < 2.5$) and show that the reconstructed invariant-mass distribution exhibits a sharp peak at M_{N_1} over a smooth background, providing a handle to separate signal from background. These results provide theoretical benchmarks for heavy-neutrino searches at ILC, CLIC, FCC-ee and CEPC.

Academic position of the presenting author

Undergraduate Student

Primary authors: MUÑOZ BELTRAN, Joan Sebastian (Universidad Nacional); Dr MARTÍNEZ MARTÍNEZ , Roberto Enrique (Universidad Nacional)

Presenter: MUÑOZ BELTRAN, Joan Sebastian (Universidad Nacional)

Session Classification: Posters & Empanadas

Track Classification: Neutrinos