

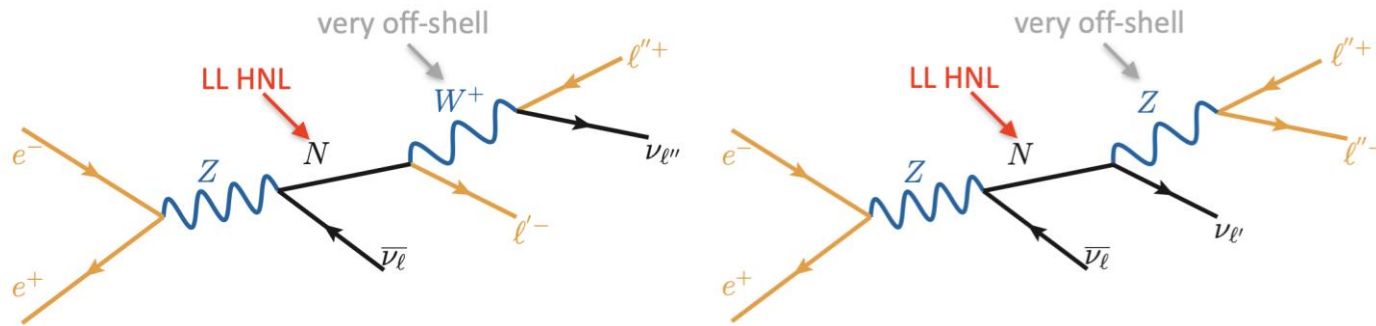
REALISTIC HNL MODEL AT FCC-ee

ECFA focus topic: LLPs round table, April 29th, 2024

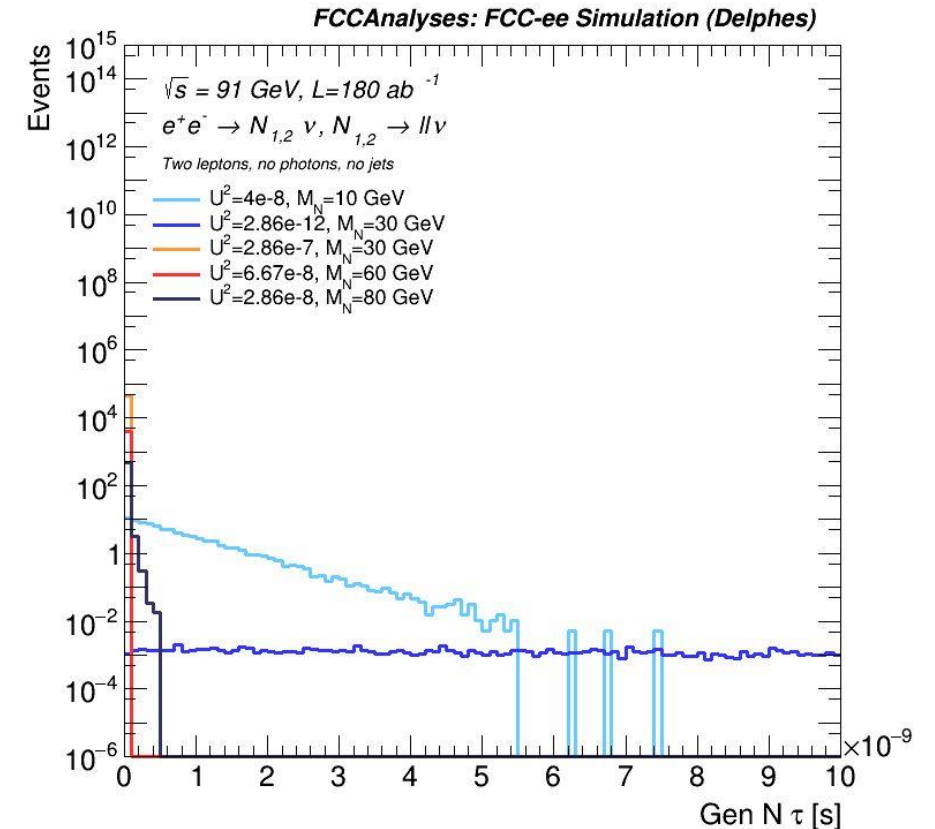
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LONG LIVED HNLs



- Production of **two heavy neutrinos** (HNLs) in a realistic seesaw I model with couplings to all leptons [Phys. Rev. Lett. 128, 051801](#)
- Cross section is maximized with quasi-degenerate masses [arXiv: 1712.07611](#)
- Simulation of Majorana HNLs at FCC-ee, $\sqrt{s}=91$ GeV
- Madgraph5 (SM_HeavyN_CKM_AllMasses_LO [arXiv:1411.7305](#), [arXiv:1602.06957](#)) + Pythia8 + Delphes with IDEA detector



$$L_N \sim 0.025 \left(\frac{10^{-6}}{V_{lN}} \right)^2 \left(\frac{100 \text{ GeV}}{m_N} \right)^5 \text{ m}$$

[Phys. Rev. D 100, 035005](#)

HNLs AT FCC-ee

- Shape-based analysis with ML fit, statistical significance computed with COMBINE Higgs tool [arXiv:2404.06614](https://arxiv.org/abs/2404.06614)
- The results show improvement from previous studies
- The work is complete, we are going to publish a preprint on the Arxiv soon

