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NA62 sensitivity to heavy neutral leptons in the low scale seesaw model

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The sensitivity of beam dump experiments to heavy neutral leptons depends on the relative strength of their couplings to individual lepton flavours in the Standard Model. We study the impact of present neutrino oscillation data on these couplings in the minimal type I seesaw model and find that it significantly constrains the allowed heavy neutrino flavour mixing patterns. We estimate the effect that the DUNE experiment will have on these predictions. We then discuss implication that this has for the sensitivity of the NA62 experiment when operated in the beam dump mode and provide sensitivity estimates for different benchmark scenarios. We find that the sensitivity can vary by almost two orders of magnitude for general choices of the model parameters, but depends only weakly on the flavour mixing pattern within the parameter range that is preferred by neutrino oscillation data.

Summary

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