

BSM physics and Heavy neutral lepton searches at FCC-ee

Saturday 20 July 2024 14:30 (17 minutes)

The origin of the neutrinos masses, baryon asymmetry in the universe, and the nature of dark matter remain fundamental open problems in HEP. The FCC-ee provides exciting opportunities to resolve these mysteries with the discovery of heavy neutral leptons (HNLs) via $e^+e^- \rightarrow Z \rightarrow \nu N$ by exploiting a huge sample ($5 \cdot 10^{12}$) of Z bosons. The expected very small mixing between light and heavy neutrinos leads to tiny mixing angles, resulting in very long HNL lifetimes and a spectacular signal topology. Recent work based on a parametrised simulation of the IDEA detector will be described. The sensitivity region in the HNL parameter space will be mapped for prompt and long-lived signatures, with emphasis on background reduction, and detector requirements. A percent-level mass resolution can be achieved with inner-detector timing over large part of the HNL parameter space. Results of models with HNLs oscillations inside the detector will be also presented.

Alternate track

1. Neutrino Physics

I read the instructions above

Yes

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