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Can LHC Test the See-Saw Mechanism?

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We consider the prospects for detecting right-handed (Standard Model singlet) neutrinos introduced in the see-saw mechanism at future accelerators. This requires sufficiently large mixing of these neutrinos with the left-handed neutrinos, which is only possible if contributions from different right-handed neutrinos to the light neutrino mass matrix cancel at a level of 10^{-8} . We search for possible symmetries behind this cancellation. Light neutrino masses can be generated as a result of small perturbations related to violation of these symmetries. The impact of these perturbations on LHC physics is however negligible so that the mechanism of neutrino mass generation and LHC physics are essentially decoupled in general. Under additional assumptions about symmetry breaking some correlation can appear between the collider observables and features of the neutrino mass matrix.

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