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Lepton flavour violating lepton decays in the inverse seesaw: SUSY and non-SUSY contributions

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In previous works (JHEP03(2012)100, JHEP09(2012)015), we have highlighted that the Higgs and Z-mediated penguin diagrams contributing to lepton flavour violating (LFV) observables like $\tau \rightarrow \mu\mu\mu$ are strongly enhanced in the supersymmetric inverse seesaw model. It has recently been pointed out (Phys.Rev.D90(2014)013008) that an error in the literature for the Z-penguins form factors would lead to a non-physical non-decoupling behaviour. This work (JHEP11(2014)048) is devoted to the study of LFV lepton decays and $\mu - e$ conversion in the supersymmetric inverse seesaw, taking all contributions into account with the corrected form factors. We explicitly distinguish various regimes depending on the dominant contribution and give predictions for various observables, some of them already within reach of the current experiments.

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