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Multilepton signals of heavier electroweakinos at the LHC

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Content :

We examine the phenomenology of the full electroweakino sector of the pMSSM without invoking the adhoc but often employed assumption that the heavier ones are decoupled. We identify several generic models which illustrate the importance of the heavier electroweakinos and constrain them with the LHC $3l + \text{missing } E_T$ data. The constraints are usually stronger than that for decoupled heavier electroweakinos indicating that the LHC data is already sensitive to their presence. We also take into account the constraints from the observed dark matter relic density of the universe and precisely measured anomalous magnetic moment of the muon. Using the allowed parameter space thus obtained, we show that in addition to the conventional $3l + \text{missing } E_T$ signatures novel multilepton (ml) + missing E_T final states with $m > 3$, which are not viable in models with lighter electroweakinos only, can be observed before the next long shut down of the LHC.

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