

# The gravitino, the muon anomalous magnetic moment and long lived particles at the LHC

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The  $\mu\nu$ S $\overline{S}$ M is the minimal supersymmetric extension of the standard model capable of solving the mu problem of the MSSM and generating neutrino masses, through an R-parity violating coupling between Higgs superfields and right-handed neutrino superfields.

The smallness of the neutrino Yukawa coupling, necessary for generating correct neutrino physics, dictates the size of the R-parity violating (RPV) interactions. For this reason, the gravitino has a life-time long enough to be a viable dark matter candidate. In addition, the smallness of RPV causes a suppression of the decay amplitude of the lightest supersymmetric particle big enough to make its decay displaced at colliders.

Light smuons are possible in the model and could explain the discrepancy between the experimentally measured value of the anomalous magnetic moment of the muon and the SM prediction. Predicting at the same time signatures of long lived particles at the LHC

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