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Correlating the anomalous moment of the muon and the W mass in the MSSM

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The electroweak (EW) sector of the Minimal Supersymmetric Standard Model (MSSM) naturally provides a cold dark matter candidate, the neutralino, and it is also able to explain current experimental observations and evade existing constraints.

In particular the EW sector of the MSSM can explain the discrepancy between the experimental result for the anomalous magnetic moment of the muon and its Standard Model prediction.

Using the recent results from the FNAL $g-2$ experiment, and focusing on the phenomenology of the EW sector of the MSSM only (i.e. assuming that the colored sector is heavy, in agreement with the current experimental limits) we study the correlation between the $g-2$ and M_W predictions in the MSSM, while keeping into account collider and DM constraints.

We also study the impact that future M_W measurements, e.g. at the ILC, could have in shaping the bounds of the allowed parameter space of the MSSM.

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