Contribution ID: **889** Type: **Parallel Session Talk**

Non-universal, Non-anomalous U(1)' in a Model with Anomaly-Mediated SUSY Breaking

Saturday, 24 July 2010 16:35 (15 minutes)

We propose a Minimal Supersymmetric Standard Model combined with a non-universal, non-anomalous U(1)' symmetry. All anomalies are cancelled in the model without any exotic fields other than the three right-handed neutrinos which are needed to generate neutrino masses. The D-term associated with the U(1)' gives rise to additional contributions to the slepton masses, rendering all slepton masses positive thus solving the slepton mass problem which generically is present in models with anomaly-mediated SUSY breaking. In addition to accommodating all SM fermion mass hierarchy, the U(1)' charges of the matter fields also dictate the flavor structure in the soft SUSY sector, leading to predictions for various flavor violating processes. The U(1)' charges of the superfields also automatically suppress baryon number violating operators.

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Session Classification: 10 - Beyond the Standard Model (theory and experimental searches)

Track Classification: 10 - Beyond the Standard Model (theory and experimental searches)