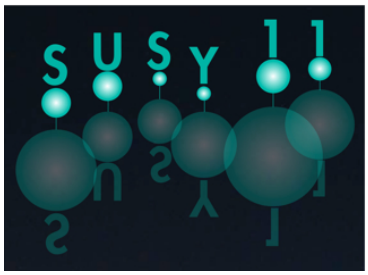

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WIMPless Dark Matter in Anomaly-Mediation with Hidden QED

Thursday, 1 September 2011 15:50 (20 minutes)

In anomaly-mediated supersymmetry breaking,
superpartners in a hidden sector have masses that are proportional to couplings squared, and so naturally freeze out with the desired dark matter relic density for a large range of masses. We present an extremely simple realization of this possibility, with WIMPless dark matter arising from a hidden sector that is supersymmetric QED with N_F flavors. Dark matter is multi-component, composed of hidden leptons and sleptons with masses anywhere from 10 GeV to 10 TeV, and
hidden photons provide the thermal bath. The dark matter
self-interacts through hidden sector Coulomb scatterings that are
potentially observable. In addition, the hidden photon contribution to the number of relativistic degrees of freedom is in the range Δ
$neff \sim 0 - 2$, and, if the hidden and visible sectors were initially in thermal contact, the model predicts Δ
$neff \sim 0.2 - 0.4$. Data already taken by Planck may provide evidence of such deviations.

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