

# Neutralino Dark Matter and Collider Signal in an $SO(10)$ model with Two-step Intermediate Scale Symmetry Breaking

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We investigate phenomenology of an  $SO(10)$  model which features two-step intermediate scale symmetry breaking,  $SO(10) \rightarrow SU(4)_C \times SU(2)_L \times SU(2)_R \rightarrow SU(3)_C \times U(1)_{B-L} \times SU(2)_L \times SU(2)_R \rightarrow SU(3)_C \times SU(2)_L \times U(1)_Y$ . We compare the low energy phenomenology of our model to mSUGRA with scalar masses, gaugino masses and trilinear couplings, which are assumed to be universal at the GUT scale. And finally, we show the direct and indirect detection rates for neutralino dark matter in our model, as well as collider signals at LHC.

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