

How a Future Leptonic Collider Will Indirectly Probe Neutralino Dark Matter

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We apply the covariant derivative expansion method to integrate out the neutralinos and charginos in the minimal supersymmetric Standard Model. The results are presented as set of pure bosonic dimension-six operators in the Standard Model effective field theory. In global fitting to the proposed leptonic collider constraint projections, special phenomenological emphasis is paid to the gaugino mass unification scenario ($M_2 \simeq 2M_1$) and anomaly mediation scenario ($M_1 \simeq 3.3M_2$). These results show that the precision measurement experiments in future lepton colliders will provide a very useful complementary job in probing the electroweakino sector, in particular, filling the gap of the soft lepton plus the missing E_T channel search left by the traditional collider, where the neutralino as the lightest supersymmetric particle is very degenerated with the next-to-lightest chargino/neutralino.

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