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Electroweak Precision Data as a Gateway to Light Higgsinos

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We investigate the prospects of probing weak-scale higgsinos through electroweak precision measurements at a future e^+e^- collider. In the Minimal Supersymmetric Standard Model, higgsinos mix with winos and binos after electroweak symmetry breaking, forming charginos and neutralinos. These states contribute to electroweak precision observables, which can be measured with high accuracy at future e^+e^- colliders. Their contributions depend on the mixing structure, as evidenced by the generation of the oblique parameters S and T, in addition to the W and Y parameters, which arise even in the absence of mixing. We demonstrate that higgsinos with masses up to ~ 500 GeV can be probed through future electroweak precision experiments, highlighting their significance in probing weak-scale supersymmetry.

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