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One-Loop Calculation of the Oblique S Parameter in Higgsless Electroweak Models

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If the Higgs boson does not show up soon, we should look for alternative mechanisms of mass generation, satisfying the many experimental constraints which the Standard Model (SM) has successfully fulfilled so far. Following this aim, we present a one-loop calculation of the oblique S parameter within Higgsless models of Electroweak Symmetry Breaking (EWSB) and analyze the phenomenological implications of the available electroweak precision data. Within an effective Lagrangian we implement the chiral symmetry breaking SU(2)*L x SU(2)_R -> SU(2)*(L+R) with Goldstones, gauge bosons and one multiplet of vector and axial-vector massive resonance states. Using the dispersive representation of Peskin and Takeuchi and imposing the short-distance constraints dictated by the operator product expansion, we obtain S at the next-to-leading order in terms of a few resonance parameters. We have found that, in order to match the experimental determination of the S parameter, the resonance masses are required to be over the TeV scale in this kind of strongly-coupled EWSB scenarios.

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