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Higgs Critical Exponents and Conformal Bootstrap in Four Dimensions

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We study properties of composite operators emerging in nonsupersymmetric, four-dimensional gauge-Yukawa theories with interacting conformal fixed points. The theories investigated are structurally similar to the standard model of particle interactions, but differ from the standard model by developing perturbative interacting fixed points. We investigate the physical properties of the singlet and the adjoint composite operators quadratic in the Higgs field. We show that, in the Veneziano limit, and at the highest known order in perturbation theory, the singlet sector decouples from the other operators. This fact allows us to test the numerical bootstrap constraints against precise four dimensional conformal field theoretical results.

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