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## A Suppressed Higgs coupling in a classically conformal extension of the Standard Model

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We consider a classically conformal  $U(1)$  extension of the Standard Model (SM).

The  $U(1)$  symmetry is radiatively broken by the Coleman-Weinberg mechanism, after which the  $U(1)$  Higgs field  $\phi$  drives electroweak symmetry breaking through a mixed quartic coupling with the SM Higgs doublet with coupling constant  $\lambda_{mix}$ .

We calculate the Higgs triple couplings in this system and find a suppression of the coupling  $g_{h\phi\phi}$  when compared to the naively expected value  $g_{h\phi\phi} \sim \lambda_{mix}v_h$  ( $v_h = 246$  GeV), likely due to the unique nature of the classically conformal potential.

We consider experimental signals for such conformal structure via the anomalous Higgs decay  $h \rightarrow \phi\phi$  and anomalous SM Higgs couplings.

Such specific conformal structure would allow for a sizeable anomalous SM Higgs coupling alongside a heavily suppressed  $h \rightarrow \phi\phi$  decay mode.

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