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Perturbative unitarity constraints on generic Yukawa interactions

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We study perturbative unitarity constraints on generic Yukawa interactions where the involved fields have arbitrary quantum numbers under an $\prod_i SU(N_i) \otimes U(1)$ group. We derive compact expressions for the bounds on the Yukawa couplings for the cases where the fields transform under the trivial, fundamental or adjoint representation of the various $SU(N)$ factors. We apply our results to specific models formulated to explain the anomalous measurements of $(g-2)_\mu$ and of the charged- and neutral-current decays of the B mesons. We show that, while these models can generally still explain the observed experimental values, the required Yukawa couplings are pushed at the edge of the perturbative regime.

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