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Effects of an Extended Color Sector on gg -> h

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Abstract:

In this study we examine how adding new colored states effects Higgs production through gluon fusion. We consider general SU(3)_c representations of scalars, fermions, and vectors and examine the effects of adding one or more of these particles, on gg -> h.
We also examine the phenomenology and constraints of these new colored states. We show that these new colored states can reduce or enhance Higgs production and in some cases these new physics effects can conspire to hide one another, leaving the Higgs production cross section unchanged from the rate predicted by the SM. Thus one can not use measurements of the Higgs production cross section alone to unambiguously apply constraints on new colored states, but when combined with direct search constraints can be a powerful handle in uncovering or excluding the existence of new colored particles.

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