

A SMEFT Analysis of Third-generation New Physics

Thursday 18 July 2024 17:19 (17 minutes)

In the quest for physics beyond the Standard Model, TeV-scale New Physics (NP) remains a very attractive possibility. However, this is challenged by constraints across different energy scales, from flavour observables to high- p_T searches at the LHC, going through electroweak precision tests. The emerging picture is that TeV-scale NP cannot have a generic flavour structure. In particular, the idea of new states coupled mainly to the third generation has recently received a lot of attention.

We present a model-independent analysis of this scenario within the SMEFT, with a $U(2)^5$ symmetry imposed on the effective operators. This reduces the number of parameters to 124, which we analyse one-by-one, taking into account RGE effects and flavour violation from the leading $U(2)$ breaking term, and confronting them against current data. We then show how under non-tuned hypotheses NP coupled mainly to the third generation can still be compatible with an effective scale as low as 1.5 TeV.

Alternate track

1. Quark and Lepton Flavour Physics

I read the instructions above

Yes

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Session Classification: Beyond the Standard Model

Track Classification: 03. Beyond the Standard Model