

# The rise and fall of light stops in the LHC top quark sample

*Saturday 20 July 2024 15:57 (18 minutes)*

We discuss the possibility that light new physics in the top quark sample at the LHC can be found by investigating with greater care well known kinematic distributions, such as the invariant mass  $m_{b\ell}$  of the  $b$ -jet and the charged lepton in fully leptonic  $t\bar{t}$  events. We demonstrate that new physics can be probed in the rising part of the already measured  $m_{b\ell}$  distribution. To this end we analyze a concrete supersymmetric scenario with light right-handed stop quark, chargino and neutralino. The corresponding spectra are characterized by small mass differences, which make them not yet excluded by current LHC searches and give rise to a specific end-point in the shape of the  $m_{b\ell}$  distribution. We argue that this sharp feature is general for models of light new physics that have so far escaped the LHC searches and can offer a precious handle for the implementation of robust searches that exploit, rather than suffer from, soft bottom quarks and leptons.

## Alternate track

1. Beyond the Standard Model

## I read the instructions above

Yes

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**Session Classification:** Top Quark and Electroweak Physics

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