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Tasting the SU(5) nature of Supersymmetry at the LHC

We elaborate on a recently found SU(5) relation confined to the up-(s)quark flavour space, that remains immune to large quantum corrections up to the TeV scale. We investigate the possibilities opened by this new window on the GUT scale in order to find TeV-scale SU(5) tests realizable at the LHC. These SU(5) tests appear as relations among observables involving either flavour violation or chirality flip in the up-(s)quark sector. We present a variety of tests, which appear as relations among observables involving flavour violation or chirality flips and rely on the techniques of top polarimetry, charm-tagging, or Higgs detection from cascade decays. We consider the cases of heavy Supersymmetry, natural Supersymmetry, and top-charm Supersymmetry. We find that $O(10)$ to $O(100)$ events are needed to obtain 50% of relative precision at 3-sigma significance for all of these tests.

additional information

The presentation will be based on the following references:

- [1] S. Fichet, B. Herrmann, Y. Stoll, arXiv:1403.3397 [hep-ph], Phys. Lett. B742 (2015) 69-73.
- [2] S. Fichet, B. Herrmann, Y. Stoll, arXiv:1501.05307 [hep-ph], accepted for publication in JHEP.

Co-authors: Dr FICHET, Sylvain (IITP Natal, Brazil); Mr STOLL, Yannick (LAPTh Annecy-le-Vieux, France)

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