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Model-independent analysis of scenarios with heavy vector-like top partners

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While a fourth generation of quarks is now strongly disfavored from the LHC results, many New Physics models predict the existence of new Vector-Like quarks as smoking gun signatures. Searches for new fermionic states heavier than the top quark are being pursued by the CMS & ATLAS collaborations, pushing the mass bounds towards the TeV scale.

In this talk, I will review the phenomenology of new heavy vector-like top partners, assuming generic couplings to the Standard Model quarks. A model-independent and general framework to study their peculiar signatures from both pair and single production will be presented, in terms of few parameters with a clear and simple connection with experimental observables.

Finally, I will present a reinterpretation of the existing bounds for non-minimal scenarios with general branching ratio assumptions and multiple vector-like quarks, and discuss new search strategies for the forthcoming searches at the LHC.

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