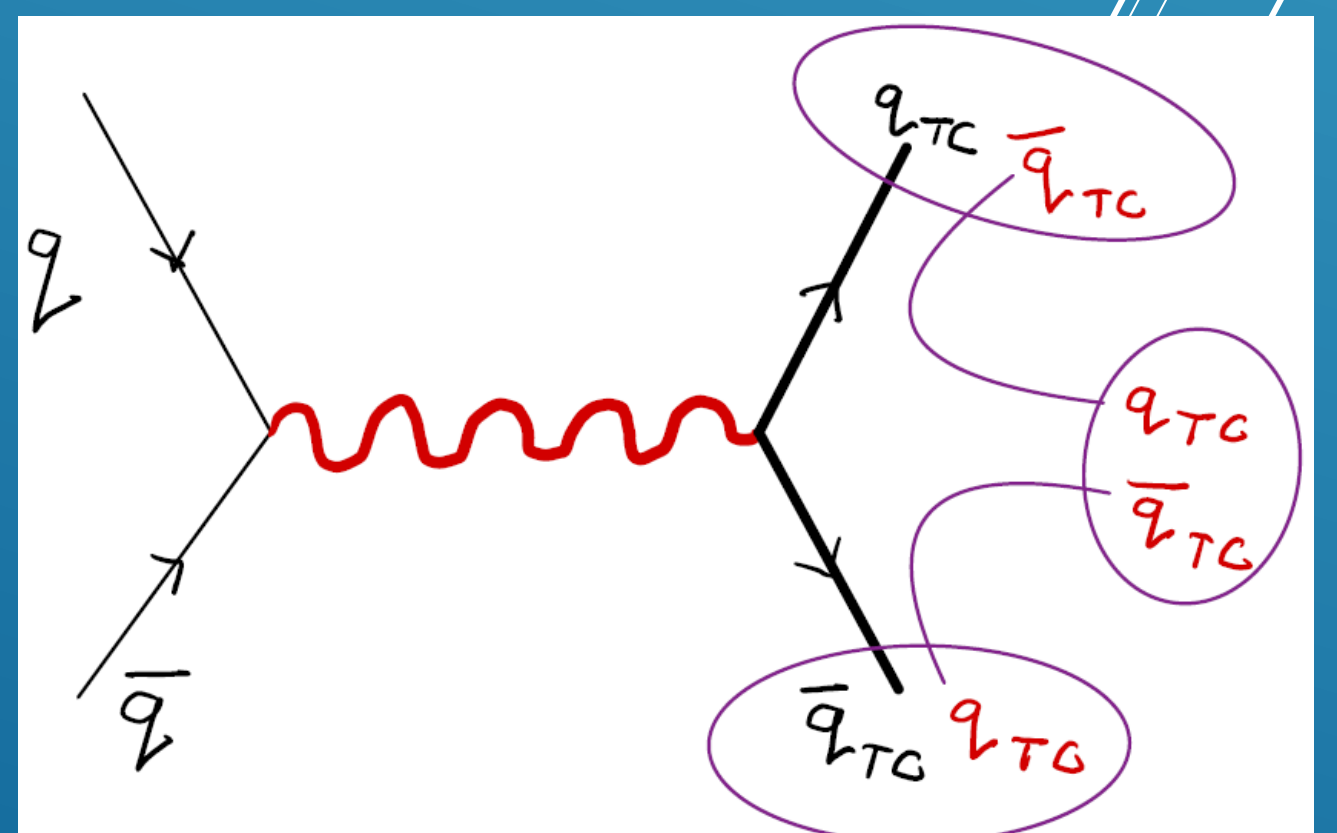


Particle Phenomenology

« A Multi-Meson Door into Compositeness »

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We consider the prospect of the SM as a composite of a new fundamental fermionic sector (q_{TC}). Such scenarios can be considered as QCD-like, where the hadronization scale $\Lambda_{TC} \sim \text{few TeV}$. The study of $\bar{q}q \rightarrow \bar{q}_{TC}q_{TC}$ at 100 TeV at FCC-hh has a direct analogue to the study of $e^+e^- \rightarrow \bar{q}q$ at around few GeV at LEP. While the latter considered the production of few-pion final states formed due to the fragmentation and eventual hadronization of the SM quarks, we will consider the production of few scalars (TC-mesons) that are formed out of the new quarks q_{TC} . In its simplest manifestation, these scalars are identified as the Higgs and the longitudinal components of the gauge bosons. The resulting multi-TC-meson final state is an artefact of the underlying QCD-like dynamics. Using the Lund string model for producing these TC mesons, we use simple kinematic discriminants to establish a proof of concept for such an analysis to be a near undisputed sign of compositeness and, hence, a need for FCC-hh.



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