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Composite pNGB Dark Matter

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Non-minimal composite Higgs (CH) models, with additional Goldstone bosons (GB) beside the Higgs, do not only present a solution to the hierarchy problem but could also shed light on the dark matter (DM) puzzle. A realization of this scenario was presented in (arXiv:1707.07685): The symmmetry breaking structure is $SO(7)/SO(6)$ and the DM is a complex GB, stabilized by an exact $U(1)_{\rm DM}$. The couplings of the top quark break explicitly both the Higgs and the DM shift symmetries, linking the DM and Higgs potentials and predicting direct detection signals of the size currently tested by XENON1T.

In this talk we shortly review the main results of (arXiv:1707.07685) and present a new class of CH models, where the main breaking of the DM shift symmetry comes either from the light quarks or from the gauging of the stabilizing $U(1)_{\rm DM}$ symmetry. This naturally explains the null results of direct detection experiments, while featuring an interesting complementary phenomenology.

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