

Accidental Composite Dark Matter and Grand Unification

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We consider models in which the Standard Model is extended with dark quarks that belong to fragments of vector-like representations of the grand-unifying group $SU(5)$, and are charged under a new confining non-Abelian interaction. We consider both strongly-coupled and weakly-coupled régimes, corresponding to the dark quarks being lighter or heavier than the confinement scale, respectively. We discuss the difference in the ordering of the spectrum of the dark baryons, the lightest of which are dark matter candidates, being accidentally stable. We focus particularly on the classification of the models and their phenomenology in the presence of a scalar dark quark that is a total singlet under the Standard Model gauge group.

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