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Bouncing pNGB Dark Matter via a Fermion Dark Matter

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In the Standard Model, the introduction of a singlet complex scalar field that acquires vacuum expectation value may give rise to a cosmologically stable pseudo-Nambu-Goldstone boson (pNGB); a good dark matter (DM) candidate with novel features at the phenomenological level, such as the reduction of the direct detection signal. This work extends this scenario by including a second cosmological stable particle: a fermion singlet. The pNGB and the new fermion can be regarded as DM candidates simultaneously, interacting with the Standard Model through a Higgs portal via two non-degenerate Higgs bosons. We explore the thermal freeze-out of this scenario, with special emphasis on the increasing yield of the pNGB before it completely freeze-out (recently called bouncing DM). We test the model under collider, relic abundance, and direct detection, and we explore the consequences of the yield bouncing on indirect detection observables today.

Collaboration / Activity

Talk

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