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Dark Matter From Minimal Flavor Violation

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We consider theories of flavored dark matter, in which the dark matter particle is part of a multiplet transforming nontrivially under the flavor group of the Standard Model in a manner consistent with the principle of Minimal Flavor Violation (MFV). MFV automatically leads to the stability of the lightest state for a large number of flavor multiplets. If neutral, this particle is an excellent dark matter candidate. Furthermore, MFV implies specific patterns of mass splittings among the flavors of dark matter and governs the structure of the couplings between dark matter and ordinary particles, leading to a rich and predictive cosmology and phenomenology. We present an illustrative phenomenological study of an effective theory of a flavor $SU(3)_Q$ triplet, gauge singlet scalar.

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