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Multi-component dark matter from Minimal Flavor Violation

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Minimal Flavor Violation (MFV) offers an appealing framework for exploring physics beyond the Standard Model. Interestingly, within the MFV framework, a new colorless field that transforms non-trivially under a global $\mathrm{SU}(3)^3$ quark flavor group can naturally be stable. Such a new field is thus a promising dark matter candidate, provided it is electrically neutral. We extend the MFV framework for dark matter and demonstrate that dark matter can naturally be multi-component across a broad parameter space. For illustration, we consider a gauge singlet, flavor triplet scalar field and identify parameter spaces for multi-component dark matter, where only the lightest flavor component is absolutely stable and heavy flavor components are decaying with lifetimes sufficiently longer than the age of the universe. Phenomenological, cosmological and astrophysical aspects of multi-component flavored dark matter are briefly discussed.

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