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## Freeze in of fermionic dark matter through flavon portal

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**Abstract:** We investigate the phenomenology of a non-thermal dark matter (DM) candidate in the context of flavor models that explain the hierarchy in the masses and mixings of quarks and leptons via the Froggatt-Nielsen (FN) mechanism. We point out a natural stabilizing mechanism for the DM within this framework. Also a very small coupling for the dark matter interaction with the visible sector which is a characteristic of FIMP, is naturally generated here. We explore the allowed parameter space for this DM candidate from relic abundance by solving the relevant Boltzmann equations. We find that reproducing the correct relic density requires the DM mass to be in the range (100 – 300) keV for  $n = 7.5$  and (3 – 10) MeV for  $n = 8.5$  where  $n$  is the U (1) FN charge of the DM fermion.

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