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Signatures of Fermion Dark Matter in the Vector Scotogenic Model

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In this study, we explored the Vector Scotogenic Model in the context of addressing the Dark Matter problem. Guided by unitarity considerations, our focus was directed toward the scenario involving fermionic dark matter. We found that co-annihilations play a crucial role in achieving the observed dark matter relic abundance. Furthermore, the effects of co-annihilation divide the parameter space into two distinct regions with differing phenomenology. Additionally, we examined the detection prospects for each region individually, emphasizing potential signatures in lepton flavor-violating decays, indirect and direct detection methods, and the production of these new particles at collider experiments.

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