

Abstract Submitted
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Exploring a Theory of Dark Matter ALICE SADY, DAVID TUCKER-SMITH, Williams College — We examine an extension to the Standard Model that accounts for the existence of dark matter. In addition to the Standard Model sector, we include a Dirac fermion serving as our dark matter candidate, a Z' boson that mediates interactions between the Standard Model particles and dark matter sector, and a Higgs-like scalar whose vacuum expectation value gives mass to the Z' . We take the Z' couplings to Standard Model fermions to be proportional to a linear combination of hypercharge Y and B-L number. We allow for kinetic mixing between the Z and Z' boson, as well as a quartic coupling between the Standard Model Higgs field and the dark matter sector Higgs field. We use the measurement of the dark matter relic abundance, results from dark matter direct detection experiments, and results from colliders to constrain the parameter space of this model.

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