

Abstract Submitted  
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**Effective WIMPs**<sup>1</sup> JEFF HUTCHINSON, University of California, Davis, SPENCER CHANG, University of Oregon, RALPH EDEZHATH, MARKUS LUTY, University of California, Davis — Null results from collider and direct detection searches constrain dark matter candidates. We analyze these constraints in the context of minimal extensions to the Standard Model (SM). The “WIMP miracle” for the relic abundance of thermal dark matter motivates models of weak scale dark matter with renormalizable couplings to SM particles. These models contain a singlet dark matter particle with cubic couplings between SM particles and “partner” particles with the same gauge quantum numbers as the SM particle. We focus on the case of dark matter interactions with colored particles. Within this framework, we consider models where the dark matter is a scalar boson, fermion, or vector boson, and may or may not be its own antiparticle. We find that collider and direct detection searches are remarkably complementary for these models. Direct detection limits for the cases where the dark matter is not its own antiparticle require dark matter masses to be in the multi-TeV range, where they are extremely difficult to probe in collider experiments. The models where dark matter is its own antiparticle are constrained by direct detection near the degenerate limit and elsewhere by the collider searches for monojet and jets + MET signals.

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