14th International Conference on
Identification of Dark Matter

18-22 July 2022
Vienna, Austria

Contribution ID: **55**   Type: **Oral presentation**

Global Fits of Dirac Dark Matter Effective Field Theories

Monday 18 July 2022 14:00 (20 minutes)

In this talk, I'll present results from a global fit of Dirac fermion dark matter (DM) effective field theory using the GAMBIT software. We include operators up to dimension-7 that describe the interactions between gauge-singlet Dirac fermion and Standard Model quarks, gluons, and the photon. Our fit includes the latest constraints from the Planck satellite, direct and indirect detection experiments, and the LHC. For DM mass below 100 GeV, we find that it is impossible to simultaneously satisfy all constraints while maintaining EFT validity at high energies. For higher masses, large regions of parameter space exist where EFT remains valid and reproduces the observed DM abundance.

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Session Classification: Parallel 1D - Dark sector