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Constraining Hidden Sectors with Light from Cosmic Strings

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A compelling minimal extension of the Standard Model consists of a TeV scale hidden sector that, from a phenomenological perspective, arises in dark matter model building and to motivate Z'searches. If the hidden sector contains a spontaneously broken Abelian gauge symmetry, then our universe is permeated by a network of cosmic "dark strings."These strings are far too light to be exposed by the standard gravitational probes. However, with a coupling to the Standard Model fields, the strings can produce SM particles in abundance, and their decay products may be observed on Earth. Over the recent years, there has been significant success in constraining empirical models of cosmic strings via astrophysical probes, particularly the diffuse gamma ray flux. In this talk, I will focus on a >~ TeV-scale hidden sector that talks to the SM via gauge kinetic mixing and the Higgs portal. Via to these interactions, the cosmic string network can radiate SM Higgs bosons whose decay products would appear on Earth as a diffuse gamma ray flux. I investigate whether bounds on the flux provide complimentary constraints to laboratory tests.

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