

## Indirect detection constraints on a p-wave model through an s-wave bremsstrahlung process

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Dark matter annihilation to a two-body final state is difficult to probe for many models because the dominate annihilation channel is velocity suppressed. The inclusion of gauge boson radiation in these models creates a three-body final state that lifts the suppression, allowing for a velocity-independent cross section that can dominate. This inclusion provides a means to investigate these types of models. We look at constraints that current indirect experiments can place on dark matter annihilation to two leptons plus a bremsstrahlung boson. In particular, we consider Fermi-LAT measurements for both its diffuse photon data as well as sourced from dwarf spheroidal galaxies. We also compare these results to constraints implied by current 21 cm measurements.

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