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Detectable Vector Dark Matter

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Ultralight dark photons are compelling dark matter candidates, but their allowed kinetic mixing with the Standard Model photon is severely constrained by requiring that the dark photons do not collapse into a cosmic string network in the early Universe. In particular, the most minimal dark photon production mechanism is constrained to small kinetic mixings out of range of all proposed direct detection experiments. I will briefly review the origin of these stringent bounds. I will then address the question “what, if anything, are dark photon experiments searching for?” I will argue that the answer to this question motivates the search for correlated signatures if a dark photon is detected in any direct detection experiment.

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