

# SIMPLY add a dark photon

*Tuesday, September 19, 2023 11:20 AM (10 minutes)*

Observations of Dark Matter (DM) density profiles are in tension with the standard collisionless DM paradigm and can hint at DM self-interactions. Moreover, observations over different scales require the self-interactions to be velocity-dependent. In the talk I will present a dark sector consisting of dark pions and dark photons that can yield the required velocity dependence, via resonant exchange of a dark photon. The pions can be strongly interacting massive particle (SIMP) dark matter, produced by the freeze-out of 3 to 2 interactions, with naturally large self-interactions and masses  $m_\pi \sim \mathcal{O}(100)$  MeV. I will then discuss the phenomenology as a result of the resonance, as well as show the viable regions of parameter space.

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