

Troubles mounting for multipolar dark matter

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In this work, we revisit the experimental constraints on the multipolar dark matter that has derivative coupling to the visible sector mediated by the Standard Model photon. The momentum dependent interaction enables them to be captured efficiently within massive celestial bodies boosted by their steep gravitational potential. This phenomena makes compact celestial bodies as an efficient target to probe such type of dark matter candidates. We demonstrate that a synergy of the updated direct detection results from DarkSide-50 and LUX-ZEPLIN together with IceCube bounds on high energy solar neutrinos from dark matter capture disfavour the viable parameter space of the dipolar dark matter scenario. Whereas, for the anapole dark matter scenario, a narrow window survives that lies within the reach of prospective heating signals due to the capture of dark matter at cold neutron stars.

Alternate track

1. Dark Matter Detection

I read the instructions above

Yes

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