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Self-interactions of ultralight spinless dark matter to the rescue?

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Numerous observations on astrophysical and cosmological scales can be interpreted to mean that, in addition to the familiar kind of matter well described by the standard model of elementary particle physics, there exists Dark Matter (DM). The fundamental properties of the elementary particles which make up the DM e.g. particle mass, spin, couplings etc are currently being observationally constrained. In particular, if DM particles have spin zero, there exist recent constraints which suggest a lower limit on its mass which is often a couple of orders of magnitude larger than 10^{-22} eV. In this talk, we will (a) argue that these limits are based on the assumption that the self coupling of the spinless DM particles is negligible, and, (b) show how some of these lower limits will get modified in the presence of incredibly feeble self interactions.

Track type

Astroparticle Physics

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