Abstract Submitted
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An estimation of the mass of fermionic dark matter AHMAD BORZOU, Baylor University — After nearly a century of hypothesizing the existence of dark matter, its mass is still unknown. In this work, we attempt to estimate the mass of fermionic dark matter. We place a lower bound on the dispersion velocity of dark matter using its positiveness. We show that the lowest dispersion velocity corresponds with the Virial state. We draw two conclusions by analyzing the observationally constructed best-fit mass models of a set of late-type galaxies. First, we show that the logarithm of the halo masses is directly proportional to the logarithm of their dispersion velocities, indicating that the halos are virialized. Second, we show that the dark matter mass over its temperature at the edge of the halos is nearly the same in all of the analyzed galaxies. The latter universality suggests that the temperature of dark matter at the edge of halos is set by its primordial history and is independent of halos' environment. Therefore, we estimate the mass of dark matter in terms of its freeze-out temperature in the early universe.

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