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Alternative Gravity Rotation curves for the Little Things Survey

JAMES O'BRIEN, JEREMY DENTICO, BRIAN STEFANSKI, ADAM SMITH, ROBERT MOSS, MODESTAS STULGE, Wentworth Institute of Technology — Galactic rotation curves have proven to be the testing ground for dark matter bounds in spiral galaxies of all morphologies. Dwarf Galaxies serve as an increasingly interesting testing ground of rotation curve dynamics due to their increased stellar formation and typically rising rotation curve. These galaxies usually are not dominated by typical stellar structure and mostly terminate at small radial distances. This, coupled with the fact that Cold Dark Matter theories such as NFW (Λ CDM) struggle with the universality of galactic rotation curves, allow for exclusive features of alternative gravitational models to be analyzed. Recently, the THINGS (The HI Nearby Galactic Survey) has been extended to include a sample of 25 dwarf galaxies now known as the Little Things Survey. Here, we present a thorough application of alternative gravitational models to the Little Things survey, specifically focusing on MOND and Conformal Gravity. An analysis and discussion of the results of the fitting procedure of the two alternative gravitational models are explored. We posit here that both the Conformal Gravity and MOND can provide an accurate description of the galactic dynamics without the need for copious dark matter.

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