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Conformal Gravity Rotation Curves and the Impact of a Quadratic Potential in Conformal Gravity JAMES O'BRIEN, University of Connecticut/ WIT — The use of Galactic Rotation Curves has long been thought to provide evidence for the existence of Dark Matter. Among the alternative theories to Dark Matter Gravitation, the Conformal Gravity theory first presented by Weyl and recently advanced by Mannheim and Kazanas presents a renormalizable, fourth order theory, which does not assume the existence of dark matter, nor is inferred as an ad hoc addition to standard gravity. Moreover, Conformal Gravity can serve to define the rotation curves of spiral and dwarf galaxies with no external free parameters, thus eliminating the ambiguity of the current dark matter halo mass models. We first present a recent modification to the Conformal Gravity potential, one which is of a scale much larger than the size of standard galaxies, and discuss its impact. We then present 110 rotation curves to Conformal Gravity, and show that the theory provides striking results, without preference to any particular choice of size or shape of galaxy. The un-biased sample includes galaxies of large spirals, dwarfs, irregulars, HSB's and LSB's, and in each and every case provides a rotation curve that is not only parameter free, but captures the structure of the data.

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