Abstract Submitted
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Scale-Invariant Dynamics of Galaxies, MOND, Dark Matter, and the Dwarf Spheroidals VESSELIN GUEORGUIEV[1], IAPS and Ronin Institute for Independent Scholarship, Montclair, NJ, USA, ANDRE MAEDER, Geneva Observatory at the University of Geneva, Switzerland — The Scale-Invariant Vacuum (SIV) theory is based on Weyl's Integrable Geometry. The main difference between MOND and the SIV theory is that the first considers a global dilatation invariance of space and time, where the scale factor λ is a constant, while the second opens the likely possibility that λ is a function of time. The key equations of the SIV framework are used here to study the relationship between the Newtonian gravitational acceleration due to baryonic matter $g_{\rm bar}$ and the observed kinematical acceleration $g_{\rm obs}$. The relationship is applied to galactic systems of the same age where the Radial Acceleration Relation (RAR), between the $g_{\rm obs}$ and $g_{\rm bar}$ accelerations, can be compared with observational data. The SIV theory shows an excellent agreement with observations and with MOND for baryonic gravities $g_{\rm bar} > 10^{-11.5}$ m s^{-2}. Below this value, SIV still fully agrees with the observations, as well as with the horizontal asymptote of the RAR for dwarf spheroidals, while this is not the case for MOND. These results support the view that there is no need for dark matter and that the RAR and related dynamical properties of galaxies can be interpreted by a modification of gravitation. [MNRAS**492**, 2698(2020)].

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