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A Comparative Study of Dwarf Spherical Galaxy Evolution Utilizing Newtonian, Dark Matter and MONDian Theory MATTHEW WALENTOSKY, BENJAMIN BLANKARTZ, STEPHEN ALEXANDER, Miami University, MIAMI UNIVERSITY COMPUTATIONAL ASTROPHYSICS LAB TEAM — Modified Newtonian Dynamics (MOND) is the only viable alternative to the dark matter paradigm to explain the observed speed discrepancies of stars in spiral galaxies. Originally proposed by Mordehai Milgrom, this alternative theory to dark matter proposes that at extremely low accelerations, Newtonian gravity requires slight modifications to Newton's Second Law. While the theory of dark matter is currently the most widely accepted theory in explaining the missing mass phenomenon, MOND's success at predicting rotation curves of spiral galaxies cannot be ignored and thus must be investigated further. We present numerical simulations of dwarf spherical galaxies similar in properties to those orbiting our own Milky Way galaxy and provide side-by-side comparisons when Newtonian, Dark Matter and MOND physics are applied to the same galaxy. The results of this study have potential implications on the understudied topic of tidal effects acting on dwarf spherical galaxies.

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