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Solutions to a Modified Newtonian Dynamics Force Law RONALD MICKENS, Clark Atlanta University — We consider a specific relation for a modified Newtonian force law[1] in one space dimension:

$$\frac{m|a|a}{(a_0 + |a|)} = F(x),$$

where $a = d^2x/dt^2$ and a_0 is a very small "cosmic" related acceleration.[2] Exact solutions are calculated for zero, constant, and linear damping forces. However, the linear harmonic oscillator force situation could not be solved exactly and, as a consequence, an approximation to the periodic solutions was determined. To check the consistency of the calculations, we took the $a_0 \to 0$ limits and found that the prior known results were obtained for all four systems.

[1]M. Milgrom, Astrophysical J., Vol. 270 (1983), 365.
[2]J. H. Gundlach, et al., Phys. Rev. Letters. Vol. 98 (2007), 150801.

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