Abstract Submitted
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MOND using a probabilistic approach USHA RAUT, University of Wisconsin-Stout — MOND has been proposed as a viable alternative to the dark matter hypothesis. In the original MOND formulation [1], a modification of Newtonian Dynamics was brought about by postulating new equations of particle motion at extremely low accelerations, as a possible explanation for the flat rotation curves of spiral galaxies. In this paper, we attempt a different approach to modify the usual force laws by trying to link gravity with the probabilistic aspects of quantum mechanics [2]. In order to achieve this, one starts by replacing the classical notion of a continuous distance between two elementary particles with a statistical probability function, Π. The gravitational force between two elementary particles then can be interpreted in terms of the probability of interaction between them. We attempt to show that such a modified gravitational force would fall off a lot slower than the usual inverse square law predicts, leading to revised MOND equations. In the limit that the statistical aggregate of the probabilities becomes equal to the usual inverse square law force, we recover Newtonian/Einstein gravity.

[1] Milgrom, M. 1983, ApJ, 270, 365
[2] Goradia, S. 2002, .org/pdf/physics/0210040

Usha Raut
University of Wisconsin-Stout

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