# Modified Entropic Force

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The theory of thermodynamics tells us the equipartition law of energy does not hold in the limit of very low temperature. It is found the Debye model is very successful in explaining the experimental results. Motivated by this fact, we modify the entropic force formula which is proposed very recently. Since the Unruh temperature is proportional to the strength of gravitational field, so the modified entropic force formula is an extension of the Newtonian gravity to weak field. On the contrary, General Relativity extends Newtonian gravity to strong field case. Corresponding to Debye temperature, there exists a Debye acceleration g_D. It is found the Debye acceleration is g_D=10^{-14}\textrm{N}\cdot \textrm{{kg}}^{-1}. This acceleration is very mu smaller than the gravitational acceleration 10^{-4}\textrm{N}\cdot \textrm{{kg}}^{-1} which is felt by the Neptune. Therefore, the modified entropic force can be very well approximated by the Newtonian gravity in solar system. With this Debye acceleration, we also find the current cosmic speeding up can be explained without invoking any kind of dark energy.

Comments: 4 pages, 2 figures. Eq.(22) and Eq.(24) are modified while leaving the figures and conclusion not altered
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