

Kading: "Chameleon-induced decoherence in an atom interferometer"

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Many modified gravity theories lead to the introduction of a new scalar field which would be expected to cause an additional gravity-like force. However, so far no solar system based observation could confirm the existence of such a fifth force. A way of explaining a force's apparent absence is by a screening mechanism. For example, chameleon scalar fields obey to a mechanism by which they adapt their mass to the mass density of their environment. In this way, a force caused by chameleons is screened in our solar system due to the large effective mass of its carrier. Nevertheless, there are possible manners of observing chameleons even in earth based experiments. One way would be to look at the effect of the chameleon force on the decoherence of two parts of a wave function in an atom interferometer. I will present the method of calculating the time of chameleon-induced decoherence in such an experiment and current results of this calculation.