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There are a number of models that aim to reconcile the observed accelerating expansion of the universe with our current understanding of general relativity. One interesting model proposes the existence of a scalar field that is screened in regions of high matter density and can therefore go unnoticed in experiments performed on Earth – colloquially referred to as the ‘chameleon field’.

In 2015 Burrage et al showed that atoms inside a vacuum chamber are too small to screen the chameleon field and could therefore be used as a probe to measure it. Since then a number of experimental searches have been undertaken using cold atoms, but have so far failed to observe its existence.

Here, we describe a number of upgrades to our experiment at Imperial College that improve our precision and reduce systematic sources of errors. We are now planning a series of experiments that will probe the remaining region in parameter space where a signature of the elusive chameleon field may exist.

Poster Abstract

Session Classification: Poster Session

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