

MP 8: Gravitation und Quantenfelder

Zeit: Mittwoch 8:45–9:35

Raum: ZHG 003

MP 8.1 Mi 8:45 ZHG 003

The Casimir effect in minimal length theories — •ANTONIA MICOL FRASSINO¹ and ORLANDO PANELLA² — ¹Frankfurt Institute for Advanced Studies — ²INFN Università di Perugia

We start by a brief review of the Casimir effect. Then we study how this effect is sensible to the smaller structure of spacetime. To achieve this, we model spacetime granularity by the presence of a minimal length implemented through a generalized uncertainty principle. We find that the quantization of the electromagnetic field is affected by the minimal length: specifically, fields can be only expanded on a set of maximally localized states that regularize the UV region of the theory. In this context we compute the lowest order correction in the minimal length parameter to the Casimir energy. We find that the correction is still attractive and scales with the fifth power of the distance between the plates. We make some considerations about the possibility of observing

this effect. Future developments will be suggested.

MP 8.2 Mi 9:10 ZHG 003

Quantum field theory on locally noncommutative spacetimes — •GANDALF LECHNER¹ and STEFAN WALDMANN² — ¹Institut für Theoretische Physik, Uni Leipzig — ²Leuven University

A class of spacetimes which are noncommutative only in a prescribed region is presented. These spacetimes are obtained by a generalization of Rieffel's deformation procedure to deformations of locally convex algebras and modules by smooth polynomially bounded \mathbb{R}^n -actions with compact support. Extending previous results of Bahns and Waldmann, it is shown how to perform such deformations in a strict sense. Some results on quantum fields propagating on locally noncommutative spacetimes are also given.