

Regularization and Renormalization of Noncommutative Quantum Field Theory

(2 Lectures)

H. Grosse

*Institute for Theoretical Physics
University of Vienna
Vienna, Austria*

The hopes to overcome the diseases of undeformed QFT by deforming space-time to a non-commutative algebra were not fulfilled, due to the appearance of the so-called IR/UV mixing. We describe first the problems of undeformed QFT, discuss deformed spaces which lead to quite interesting regularizations preserving symmetries. Next the IR/UV mixing is discussed. For the case of a scalar QFT over the canonical deformed four-dimensional space-time we managed in work with R. Wulkenhaar to overcome this problem by going to a duality covariant model and were able to show that the model is renormalizable perturbatively. This proof is sketched.