

Noncommutativity-Induced Discretization of a (3+1)-Dimensional Field Theory

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ABSTRACT

A non-commutativity induced discretization of space is extended from the planar (2+1)-case to (3+1) dimensions. The equations of motion are solved and the continuum/commutative limits of the solutions discussed. The univoque relation between the non-commutative higher-dimensional representation and the discrete lower-dimensional one is detailed. Possible uses for nonperturbative studies, in particular as an alternative to lattice field theory, are discussed. Discrete versions of special-function-type solutions are essential to the analysis.