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SEMINAR NOTICE

TITLE: **Simulating the Abelian Chern-Simons Theory on the Moyal Plane**

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Abstract

Since its formulation, Noncommutative Geometry(NCG)[1] has appeared in various places in theoretical physics as a framework to understand geometry within an algebraic setting and also as an mechanism to regulate the divergences which typically appear in quantum field theories. Topological field theories are, on the other hand, are interesting as it manages to probe the geometry of the underlying spacetime on which the theory is defined.

In this work, we report on our attempts to numerically simulate a simple topological field theory, namely, the noncommutative Abelian Chern-Simons theory[2] defined on the Moyal plane, which is defined by the operator relation $[x,y] = i\theta$. θ is the parameter providing a measure of the noncommutativity. In this framework, the coordinates x,y are represented by NxN dimensional hermitian matrices and the parameter θ provides a measure of the noncommutativity in space . We measure the action and specific heat of the system using the metropolis algorithm by varying N and the parameter The results indicate that for large value of θ the system behaves similar to its commutative counterpart.