

November 23, 2016, 16:30-18:00

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ERGODICITY OF THE FEYNMAN-KAC SEMIGROUP IN THE RENORMALIZED NELSON MODE

In this working seminar talk I will briefly review some Fock space calculus and the construction of a Q -space representation of Fock space. After that I will explain the structure of recent Feynman-Kac formulas for semi-groups generated by Hamiltonians in non-relativistic quantum field theory. Then I will employ the Feynman-Kac formulas together with some standard tools of mathematical quantum field theory to demonstrate that the corresponding semi-groups are positivity improving. Here the notion of positivity in Fock space is induced by the canonical notion of positivity in Q -space, which is an L^2 -space associated with a probability measure. In the case of the renormalized Nelson model, which will serve as our main example, these results are new. According to general principles, ground state eigenvalues of Hamiltonians generating a positivity improving semi-group are non-degenerate and the corresponding eigenvector can be chosen strictly positive.

My presentation will partly be based on joint work with Batu GÜNEYSU and Jacob Schach MØLLER.