



Contribution ID: 62

Type: **Talk**

Analytic computations of an effective lattice theory for heavy quarks

Thursday, 16 July 2015 11:40 (20 minutes)

We discuss the fermionic contribution to a three dimensional effective lattice theory for heavy quarks. We first study the mathematical structure of higher order contributions of the hopping parameter expansion to the effective action. We then examine how to apply a graphical linked cluster expansion to retrieve analytical results for various lattice quantities such as nucleon number and nucleon binding energy. The free parameters of the analytic results are temperature, chemical potential and the hopping parameter. The results are compared to Monte Carlo simulations of the dimensionally reduced theory.

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Session Classification: Nonzero Temperature and Density

Track Classification: Nonzero Temperature and Density