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Functional Fit Approach (FFA) for Density of States method: SU(3) spin system and SU(3) gauge theory with static quarks

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We study new developments for the Density of States (DoS) method to simulate systems affected by the complex action problem. In particular we use the functional fit approach (FFA). It consists of a restricted Monte Carlo simulation with an additional Boltzmann factor, which allows one to explore the DoS for a given part of the spectrum. We fit the simulation data with a known function to obtain the parameters of the DoS. We apply the approach to two model systems: 1) The SU(3) spin system with a chemical potential; 2) The SU(3) gauge theory with static quarks. We discuss the technical challenges and the potential of FFA DoS.

Primary author: Mr GIULIANI, Mario (University of Graz)

Co-authors: Prof. GATTRINGER, Christof (University of Graz); Mr TOEREK, Pascal (University of Graz)

Presenter: Mr GIULIANI, Mario (University of Graz)

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