Finite density simulations using a determinant estimator

Presenter: Andrei Alexandru — University of Kentucky
Andrei Alexandru, Anyi Li, Keh-Fei Liu

Previous investigations have shown that the canonical approach to simulating QCD at finite density is very promising. The algorithm we used in our earlier work employs an exact calculation of the fermionic determinant – this limits the size of the lattices we can simulate. Very interesting questions can only be answered if we simulate at larger volume. In this talk we explore an algorithm, Hybrid Noisy Monte Carlo, that employs a determinant estimator rather than an exact calculation: we first present the technical aspects of the estimator, we check that the algorithm is correct by comparing it with our previous study and then we discuss its merits. We will also discuss the challenges faced when simulating larger lattice volumes.