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Variance-reduction algorithms for lattice QCD

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A significant component of the cost of making physical predictions from lattice QCD stems from the computation of correlation functions on a fixed ensemble of gauge fields. This cost is highly dependent on the observable of interest and the details of its representation, including any approximation needed to estimate it, aside from the sampling algorithm used for the fields. Moreover, the variance of such estimators may depend strongly on physical parameters such as the lattice spacing and volume, which gives an important insight into the cost of reaching the relevant physical limits. In this talk, I will review some observables involving quark propagators, in particular quark connected and disconnected diagrams, and discuss variance-reduction schemes based on decompositions of the propagators. Such strategies have already proven useful for precision physics observables and in future may help reduce the computational cost of approaching large volumes.

Parallel Session (for talks only)

Plenary talk

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