



Contribution ID: 609

Type: Oral presentation

A method to estimate observables with infinite variance in fermionic systems

Thursday, 29 July 2021 22:00 (15 minutes)

Numerical estimation of fermionic observables often requires introduction of auxiliary bosonic fields that have no direct physical relevance through a Hubbard-Stratonovich transformation. The variance of some fermionic observables (for example, appropriately constructed local four-fermion operators in 2d Gross-Neveu model) when they are estimated using such auxiliary fields may not correspond to any physical observable and in particular it may diverge. In such cases it is not clear how one can reliably estimate a physical observable. An important example may be found in the context of exceptional configurations in quenched qcd. We demonstrate other examples in some toy models by appropriately constructing some four-fermion operators. We then propose a suitably chosen discrete Hubbard-Stratonovich transformation that doesn't suffer from such divergences for these classes of observables.

Primary authors: YUNUS, Cagin (MIT); Prof. DETMOLD, William (MIT)

Presenter: YUNUS, Cagin (MIT)

Session Classification: Particle physics beyond the Standard Model

Track Classification: Particle physics beyond the Standard Model