Contribution ID: **10** Type: **not specified**

Machine Learning Algorithms for faster determination of Lattice QCD Hadron Correlators

Tuesday 28 September 2021 16:40 (30 minutes)

A big portion of Lattice QCD calculations requires the calculation of hadronic two-point correlation functions. These can be computationally challenging mostly depending on the size of the systems that are simulated and on the physical parameters. We present a new procedure that allows for reduced computational resources to calculate hadronic two-point functions on the lattice. We apply a variety of machine learning regression algorithms, to relate propagators obtained with the BiCGStab linear solver with different convergence parameters. A mapping between low precision propagator
data to high precision propagators is investigated and an assessment of the systematic uncertainty over the gauge field configuration ensemble of the procedure is discussed. The validity of the method is assessed based on derived quantities such as effective masses of hadrons, together with the potential gain in computer time, and on the robustness of the results to the different models that are tested. The method is found to be stable and to produce results that are comparable with traditional computations while requiring significantly less computer time.

Presenter: PEDERIVA, Giovanni (Michigan State University)

Session Classification: Session 4