Plan Overview

A Data Management Plan created using dmptool

Creators: Ciaran Hughes, James Simone, Andreas Kronfeld

Affiliation: Non Partner Institution

Funder: United States Department of Energy (DOE)

Template: Department of Energy (DOE): Office of Science

ORCID ID: 0000-0001-8515-3337

ORCID ID: 0000-0002-9711-2409

ORCID ID: 0000-0003-2716-1149

Project abstract:
We propose to continue our computation of the axial-vector form factor of the nucleon using the highly-improved staggered-quark (HISQ) action for both valence and sea quarks. We use the (2+1+1)-flavor HISQ ensembles generated at the physical point, combining lattice QCD calculations of the q^2 dependence with the z expansion to obtain a model-independent description of the shape. With previous support from USQCD, we have computed the axial charge g_A directly at the physical point and tested our approach by reproducing the baryon number g_V (obtaining 1 after renormalization). We now focus on the shape of the axial and vector form factors, the latter of which is constrained by high-statistics electron-scattering data. The project is well aligned with USQCD goals, because the axial-vector form factor is an important ingredient in quasielastic neutrino-nucleon scattering, which is the key signal process in neutrino-oscillation experiments at Fermilab.

We request 206.26 kGPU-hours and 5.20 M Sky-core-hours at BNL or Fermilab; we also request 100 Tbyte disk space and 200 Tbyte tape storage. Using USQCD conversion factors, the total request is 13.07 M Sky-core-hours.

Last modified: 03-08-2021

Copyright information:
The above plan creator(s) have agreed that others may use as much of the text of this plan as they would like in their own plans, and customize it as necessary. You do not need to credit the creator(s) as the source of the language used, but using any of the plan's text does not imply that the creator(s) endorse, or have any relationship to, your project or proposal.
The Nucleon Axial-Vector Form Factor at the Physical Point with the HISQ Ensembles

1. Data sharing and preservation

For this project there are three classes of data that are being generated:

1. Staggered point-source propagators on the second generation a=0.12fm and 0.09fm MILC ensembles.
2. Unaveraged two- and three-point correlator data on the above ensembles, including metadata.
3. Plotted data used in figures and tables for publications using the data given in 1) or 2).

Preservation:

1. Propagator data will not be kept as it is too large and expensive.
2. The unaveraged correlator data - including metadata - will be kept in sqlite3 databases (a standard format accepted as future proof by office of science). This data will stored on disk where USQCD gives storage as part of our allocation for the duration of the project. After the project has met it's goals and finished, the data will be kept an additional 3-5 years on disk. If funding is not allocated for this storage, then personal harddrives will be used to store the data.
3. The plotted data will be submitted to HEPdata.net and or kept in sqlite3 databases and will follow the same preservation plan as data in 2.

Sharing:

1. NA
2. The unaveraged correlator data in sqlite3 databases - including metadata - will be made available upon request as soon as the time of publication. The publication will indicate this.
3. Identical to data in 2).

Management:

- The management of the data will fall under the remit of the PI of this grant, and if the PI changes then the subsequent PI will take over management also.

2. Data used in publications

Addressed in Section 1.

- All preserved data will be made publicly available at the time of publication, if not before.
- All data will be in standard format: correlator and results/figures/tables in sqlite3 database.

3. Data management resources

All resources (FNAL/BNL tape and disk storage) are under the control the USQCD executive committee and so we do not require additional permissions to hold propagators or databases at such facilities. The Fermilab Lattice and MILC collaboration's overall data management plan is available online: DMP_FNAL_MILC.pdf
4. Confidentiality, security and rights

No data breaches any confidentiality or pose any security issues for the U.S., or any associated facility.