Plan Overview

A Data Management Plan created using DMP Tool

Title: The Nucleon Axial-Vector Form Factor at the Physical Point with the HISQ Ensembles

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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.

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Copyright information:

The Nucleon Axial-Vector Form Factor at the Physical Point with the HISQ Ensembles

1. Data sharing and preservation

Data management plans should describe whether and how data generated in the course of the proposed research will be shared and preserved. If the plan is not to share and/or preserve certain data, then the plan must explain the basis of the decision (for example, cost/benefit considerations, other parameters of feasibility, scientific appropriateness, or limitations discussed in #4). At a minimum, DMPs must describe how data sharing and preservation will enable validation of results, or how results could be validated if data are not shared or preserved.

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

1. Staggered point-source propagators on a=0.12fm and potentially on 0.09fm MILC ensembles.
2. 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 be only kept temporarily during the campaign as it is too large and expensive to store longer term.
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. Fermilab will provide long-term tape storage of the nucleon data as well as analysis results that go into publications since it is the home institution of several collaborators on this project.
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

Data management plans should provide a plan for making all research data displayed in publications resulting from the proposed research open, machine-readable, and digitally accessible to the public at the time of publication. This includes data that are displayed

in charts, figures, images, etc. In addition, the underlying digital research data used to generate the displayed data should be made as accessible as possible to the public in accordance with the [Principles](#) published in the DOE Policy for Digital Research Data Management. The published article should indicate how these data can be accessed.

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

Data management plans should consult and reference available information about data management resources to be used in the course of the proposed research. In particular, DMPs tht explicitly or implicitly commit data management resources at a facility beyond what is conventionally made available to approved users should be accompanied by written approval from that facility. In determining the resources available for data management at DOE Scientific User Facilities, researchers should consult the published [description of data management resources](#) and practices at that facility and reference it in the DMP. Information about other Office of Science facilities can be found in the [additional guidance from the sponsoring program](#).

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

Data management plans must protect confidentiality, personal privacy, [Personally Identifiable Information](#) and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; avoid significant negative impact on innovation and U.S. competitiveness; and otherwise be consistent with all applicable laws, regulations, agreement terms and conditions, and DOE orders and policies. There is no requirement to share proprietary data.

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