Status and plans for lattice HVP section

Steven Gottlieb
Antonin Portelli

Seventh Plenary Workshop of the Muon g-2 Theory Initiative
KEK Laboratory, Tsukuba, Japan
September 11, 2024

Status I

✦ Original outline:

1. Summarised introduction: Antoine Gérardin (Mainz & BMWc); Michele Della Morte (SDU) 1 page
2. Methodology: Ethan Neil (Fermilab/MILC/HPQCD) 1 page
3. Comparisons
    1. Total HVP: Laurent Lellouch (BMWc) 2 pages
    2. Intermediate window: Ruth Van de Water (Fermilab/MILC/HPQCD) 3 pages
    3. Isospin symmetric HVP: Roberto Frezzotti (ETMC); J. Tobias Tsang (RBC/UKQCD); 2 pages
    4. Isospin-breaking corrections: Vera Gülpers (RBC/UKQCD) 1 page
4. Related observables
    1. Tau decays: Mattia Bruno (RBC/UKQCD) 0.5 pages
    2. Running of alpha_em: Marco Cé (Mainz) 1 page
5. Further cross-checks: Harvey Meyer (Mainz) 1 page
6. Summary and outlook: Antonin & Steve 1 page

Status II

✦ New Outline

1. Executive summary of lattice QCD result for HVP contribution to g-2
2. Methodology
3. Total HVP
4. Window contributions
    1. Definitions
    2. Long-distance window
    3. Intermediate window
    4. Short-distance window
5. Other observables
6. Further cross-checks

Plans I

- ✦ Five groups will present current status:
  - BMW: Laurent Lellouch
  - Mainz: Simon Kuberski
  - RBC/UKQCD: Christoph Lehner
  - Fermilab/HPQCD/MILC: Shaun Lahert
  - ETMC: Urs Wenger
- ✦ Four additional talks:
  - Update on the isospin breaking corrections to the HVP with C-periodic boundary conditions: Paola Tavella
  - Variance reduction in lattice computations of hadronic vacuum polarization: Roman Gruber
  - Data-driven determination of the light-quark connected components of the short- and long-distance window contributions to the muon g-2: Diogo Boito
  - Time-kernel for lattice determines of NLO HVP contributes to the muon g-2: Stefano Laporta

Plans II

- We currently have quite bit of text arranged according to the old outline
- Following this meeting, we will edit the current draft and move material in accordance with the new outline.
- Obviously, we need to update current text to account for the latest results show here, at Lattice 2024, and new publications up to the inclusion deadline.
- Current expectation is that we will have multiple results to compare for the windows quantities.
  - How many complete results for lattice HVP will be available?