

Instrumental uncertainties in radiative corrections for the MUSE experiment

Thursday, 6 June 2024 16:30 (30 minutes)

The MUSE experiment at the Paul Scherrer Institute is measuring elastic lepton-proton scattering cross sections in a four-momentum transfer range from Q^2 of approximately 0.002 to 0.08 GeV² using positively and negatively charged electrons and muons. The extraction of the Born cross sections from the experimental data requires radiative corrections. Estimates of the instrumental uncertainties in those corrections have been made using the ESEPP event generator. The results depend in particular on the minimum lepton momentum that contributes to the experimental cross section and the fraction of events with hard initial-state radiation that is detected in the MUSE calorimeter and is excluded from the data. These results show that the angular-dependent instrumental uncertainties in radiative corrections to the electron cross section are better than 0.4 % and are negligible for the muon cross section.

This material is based upon work supported by the National Science Foundation under NSF grant PHY-2111050. The MUSE experiment is supported by the Department of Energy, NSF, PSI, and the US-Israel Binational Science Foundation.

Primary author: STRAUCH, Steffen (University of South Carolina)

Presenter: STRAUCH, Steffen (University of South Carolina)

Session Classification: Session 7