

Measuring the weak mixing angle with P2

Project B01 in CRC1660

Prof. N. Berger

Join our new Collaborative Research Center (CRC) “Hadrons and Nuclei as Discovery Tools” at the JGU Mainz and help advance the frontiers of atomic, nuclear, and hadron physics. Apply now and be part of this unique collaborative effort. Specifically, Prof. Niklaus Berger is seeking motivated PhD candidates to join our research program in parity-violating electron scattering.

The parity-violating electron scattering program at the newly constructed electron accelerator MESA with the P2 spectrometer aims at determining the weak charge of the proton and thus the weak mixing angle at an unprecedented level of precision, improving the existing results by factors of 3 to 4. This measurement requires a precise knowledge of the momentum transfer Q^2 of the electrons, which we will determine using a tracking detector built from ultra-thin high-voltage monolithic active pixel sensors (HV-MAPS).

The PhD candidate is expected to take up a leading role in the commissioning and calibration of the tracking detector, and take up in the data-analysis with as a set goal of a publishable first Q^2 measurement in the doctoral thesis. Strong data analysis and programming skills, experience with electronics and particle detectors, and familiarity with experimental physics techniques are considered a plus.

We offer a dynamic and experienced research environment at Johannes Gutenberg University Mainz, including access to our graduate school, a collaborative research center, and the [PRISMA+](#) Cluster of Excellence. Additionally, candidates will have the opportunity to work within the international P2 collaboration at the MESA accelerator. For more information, don't hesitate to contact us, and check out the following references:

- D. Becker et al, The P2 Experiment - A future high-precision measurement of the electroweak mixing angle at low momentum transfer, [Eur. Phys. J. A \(2018\) 54: 208](#), [arxiv:1802.04759](#)

To apply, please send your CV and motivation to Prof. Dr. Niklaus Berger (niberger@uni-mainz.de) and arrange for two letters of reference to be sent to the same address.



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