## **EPIC 2024: Electroweak Physics InterseCtions**



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## Electron Scattering Experiments for Neutrino Physics at MAMI

The groundbreaking discovery of neutrino oscillations represents a concrete indication of new physics and the measurement of the oscillation parameters has the potential to unlock new knowledge on the fundamental building blocks of matter.

For measuring the neutrino properties to percent-level precision, a new era of accelerator-based experiments was started. For those experiments, the limited understanding of neutrino-nucleus interactions introduces the largest uncertainty and prevents achieving the desired precision.

This contribution explains how electron scattering experiments can provide crucial information for neutrino research by benchmarking theoretical models and improving the simulations needed for reliably extracting neutrino oscillation parameters. Electron beams, with their precise energy and intensity, lead to high precision data, establishing electron-nucleus scattering as an

extremely useful technique, contributing towards the goals of next-generation neutrino experiments.

In particular, the MAMI accelerator together with the A1 experimental setup, is very well suited for collecting a large high-quality dataset on various nuclear targets in the energy range up to 1.6 GeV.

In this contribution, preliminary data from recent MAMI experiments on  $^{12}$ C,  $^{16}$ O and  $^{40}$ Ar nuclei will be shown.

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