

Shedding light on the neutrino charge radius with CE ν NS data

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Neutrinos are among the most fascinating particles of the standard model (SM). We know very little about their nature and unveiling their secrets might be the key to broadening our understanding of nature. Despite being extremely elusive particles, they can undergo a process where their interaction cross-section with matter is enhanced by orders of magnitudes: this is Coherent Elastic Neutrino Nucleus Scattering, also known as CE ν NS. This process has proven to be a formidable tool for testing our understanding of particle physics, particularly within the realm of electroweak interactions.

In this presentation, I will exploit CE ν NS data to present the state-of-the-art constraints on the neutrino charge radius, which the only neutrino electromagnetic property predicted to be non-zero in the standard electroweak theory [1].

Finally, I will show how the momentum dependence on the neutrino charge radius can be exploited to further constrain the allowed parameter space [2].

[1] arXiv: 2205.09484 - JHEP 09 (2022) 164

[2] arXiv 2402.16709 - accepted by JHEP

Title of the Poster/Talk

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