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The weak mixing angle in the DUNE near detector complex

One of the key parameters of the Standard Model, the weak mixing, arises as a consequence of the electroweak symmetry breaking. Its measurement at different momentum-transfers is a crucial test of the consistency of the Standard model, as it can confirm the running predicted by the theory. The high intensity beam of the future DUNE experiment will allow to perform a precise measurement of rare processes, such as neutrino-electron and trident scatterings, crucially dependent on the weak mixing angle. We show that, using the DUNE-PRISM capabilities, DUNE will be able to constrain the electron-Z boson couplings and the weak mixing angle, with a precision better than $\sim 2\%$ at a unique momentum transfer.

Mini-abstract

Rare neutrino scatterings will allow DUNE to constrain the weak mixing angle at precision of 2%

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