

# Low-Energy Experiments for the determination of the Electroweak Mixing Angle and the P2 experiment

*lunedì 5 giugno 2023 16:30 (25 minuti)*

Indirect searches for new physics beyond the standard model employ precision measurements of low energy observables like for example the weak mixing angle expressed as  $\sin^2 \theta_W$ . There are several possibilities to measure this quantity, one is the measurement of a parity-violating asymmetry in elastic electron-proton scattering.

The P2 experiment at the upcoming Mainz energy recovering electron accelerator MESA aims for a 2% measurement of such an asymmetry at very low four-momentum transfer of  $q^2 = 0.005 \text{ (GeV/c)}^2$ . This measurement allows the extraction of a precise determination of the weak mixing angle with an accuracy of 0.15%.

In combination with the high energy physics measurement of  $\sin^2 \theta_W$  at the Z-pole it comprises a test of the Standard Model. Any significant deviation is a sign for new physics beyond the Standard Model with a sensitivity to a mass scale up to about 50 TeV. Further measurements employing a Carbon target will increase this reach.

**Autore principale:** MAAS, Frank (Helmholtz-Institut Mainz)

**Relatore:** MAAS, Frank (Helmholtz-Institut Mainz)

**Classifica Sessioni:** Hadrons and physics beyond the standard model

**Classificazione della track:** Hadrons and physics beyond the standard model