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Contribution ID: 3927

Type: **Invited Speaker / Conférencier(ère) invité(e)**

## **(I) The P2 experiment at MESA - A high precision measurement of the weak mixing angle**

*Monday 19 June 2023 16:00 (30 minutes)*

The weak mixing angle can be measured in parity-violating elastic electron-proton scattering. The aim of the P2 experiment is a very precise measurement of the weak mixing angle with an accuracy of 0.15% at a low four-momentum transfer of  $Q^2 = 4.5 \times 10^{-3} \text{ GeV}^2$ . In combination with existing measurements at the Z pole with comparable accuracy, this comprises a test of the standard model with a sensitivity towards new physics up to a mass scale of 50 TeV. In addition to the measurement using a liquid hydrogen target, other targets, such as carbon and lead, are considered for measuring parity-violating elastic electron scattering. The experiment will be built at the future MESA accelerator in Mainz. In this talk, the motivation and challenges for these measurements will be discussed.

### **Keyword-1**

Standard Model Test

### **Keyword-2**

Electron scattering

### **Keyword-3**

Fundamental Symmetries

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**Session Classification:** (DNP) M3-4 Testing the Standard Model at low and intermediate energies | Tester le modèle standard à des énergies faibles et intermédiaires (DPN)

**Track Classification:** Technical Sessions / Sessions techniques: Nuclear Physics / Physique nucléaire (DNP-DPN)