



**Irfu**

Institut de recherche  
sur les lois fondamentales  
de l'Univers

**Séminaire  
DPhP**

**Lundi 14/01/2019, 11h00**

CEA-Saclay Bât. 141, salle André Berthelot

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## **High precision measurement of the weak mixing angle by parity violating electron scattering at low momentum transfer**

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The P2 experiment at the Mainz energy recovering linear accelerator MESA aims for a high precision determination of the weak mixing angle  $\sin^2\theta_W$  to a precision of 0.15% at low four-momentum transfer. This accuracy, comparable to existing measurements at the Z pole, allows for a sensitive test of the Standard Model up to a mass scale of 50TeV, extendable to 60TeV. The weak mixing angle is connected to the weak charge of the proton which will be extracted from a measurement of the parity violating cross section asymmetry in elastic electron-proton scattering. A necessary accuracy is achievable in a measurement time of 10 000 h using a 150  $\mu$ A polarized electron beam impinging on a 60 cm liquid hydrogen target. The use of a solenoid-spectrometer with 100% -acceptance as well as an atomic H trap polarimeter are new features, which have never before been used in parity-violation experiments. In order to collect the enormous statistics required for this measurement, the new Mainz Energy Recovery Superconducting Accelerator (MESA) is under construction.

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Le café sera servi 10 minutes avant.

NB : La présentation d'une pièce d'identité est exigée à l'entrée du centre. Tous les auditeurs extérieurs sont priés de prévenir à l'avance Martine Oger, tél. 01 69 08 23 50, e-mail : [martine.oger@cea.fr](mailto:martine.oger@cea.fr). (U.E. : délai de 24 h, hors U.E. : délai de 4 jours).