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Testing the Standard Model of Particle Physics with Neutron Beta Decay

Tuesday, 20 June 2017 14:30 (45 minutes)

Neutron Beta Decay is described accurately within the Standard Model of Particle Physics using the first CKM-matrix element, Vud, and the ratio of vector and axial vector couplings, λ, as parameters. Angular correlations, spectra and the neutron lifetime are accessible experimentally, providing an excellent toolkit for investigating the structure of weak interaction and potential deviations from the predictions of the Standard Model.

In this talk I will present the world's most precise measurement of the Beta Asymmetry performed with the decay spectrometer PERKEO III carried out at the PF1B cold neutron beam facility at the Institut Laue-Langevin as one of the examples of recent measurements in this field.

Moreover an overview of the progression towards the next generation of instruments in the field of Neutron Beta Decay studies is discussed. This includes the instrument PERC which is currently under construction and is to be built up at the new MEPHISTO cold neutron beam facility at the FRM2.

Primary author: Mr SAUL, Heiko (TUM)

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