

aSPECT: Final result of measuring the angular correlation coefficient between electron and antineutrino momentum in free neutron β -decay

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Precise measurements of the angular correlation coefficient in free neutron β -decay can be used to determine the parameters of Weak Interaction. Mainly the ratio λ between the axial g_A and vector coupling g_V can be derived independently from different angular correlation coefficient measurements. Further the value of the first diagonal matrix element V_{ud} of the CKM-matrix can be determined by measuring λ and the neutron life time τ_n with neutron β -decay and using the Fermi constant G_f from μ -decay.

In my talk I will briefly discuss the determination of λ derived from the correlation coefficient A measured by PERKEO III. Then I will focus on the determination of λ from the correlation coefficient a measured by aSPECT, including the reanalysis of aSPECT just finished. Finally I will discuss the tension between the λ values of PERKEO III and aSPECT and show how angular correlation coefficient measurements can be used to search for physics beyond the Standard Model.