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Results from the aSPECT experiment

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We report on a precise measurement of the antineutrino-electron angular correlation (the a coefficient) in free neutron beta-decay from the a SPECT experiment. The a coefficient is inferred from the recoil energy spectrum of the protons which are detected in 4π by the a SPECT spectrometer using magnetic adiabatic collimation with an electrostatic filter. Data are presented from a 100 days run at the Institut Laue Langevin in 2013. The sources of systematic errors are considered and included in the final result. We obtain $a = -0.10430(84)$ which is the most precise measurement of the neutron a coefficient to date. From this, the ratio of axial-vector to vector coupling constants is derived giving $\lambda = -1.2677(28)$, in slight tension with other results.

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