

Relation of the Anomalous Magnetic Moment of Electron with the Proton and Neutron Masses

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Abstract : The anomalous magnetic moment of the electron is calculated by introducing the effective mass of the virtual part of the electron structure. In this case, the anomalous moment is inversely proportional to the effective mass M_{eff} , which is shown to be a linear combination of the neutron, proton, and electrostatic electron field masses. The spin of a rotating structure is assumed to be equal to $3/2$, while the spin of a 'bare' electron is equal to unity, the resultant spin being $1/2$. A simple analysis gives the coefficients for a linear combination of proton and electron masses, the approximation precision giving here nine significant digits after the decimal point. The summand proportional to α^2 adds four more digits. Thus, the conception of the effective mass M_{eff} leads to the formula for the total magnetic moment of the electron, which is accurate to fourteen digits. Association with the virtual beta-decay reaction and possible reasons for simplicity of the derived formula are discussed.

Keywords : anomalous magnetic moment of electron, comparison with quantum electrodynamics. effective mass, fifteen significant figures, proton and neutron masses

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