357(2): Calculation of the Anomalous g Factor of the Electron in the Dirac Theory extended by Fluid Electrodynamics.

As in papers such as UFT 250 the relevant term for the g factor of the electron in the Dirac theory is:

$$H_1 \phi = -\frac{e}{2m} \left(i \underline{\sigma} \cdot \underline{\hat{p}} \times \underline{W} \right) \phi + \ldots \quad -(1)$$

where

$$\hat{p} \phi = -i\hbar \underline{\nabla} \phi \quad -(2)$$

Here $-e$ is the electron charge, m is the electron mass, $\underline{W}$ the vector potential of the minimal prescription:

$$\underline{p} \rightarrow \underline{p} - e\underline{W} \quad -(3)$$

$\hbar$ the reduced Planck constant, $\underline{\sigma}$ the Pauli matrix operator and ϕ the wave function.

From eqs. (1) and (2):

$$H_1 \phi = -\frac{e\hbar}{2m} \underline{\sigma} \cdot \underline{B} \phi \quad -(4)$$

$$= -\frac{e}{2m} \left(\boxed{2} \underline{S} \cdot \underline{B} \right) \phi$$

$\uparrow$ g factor

where the spin angular momentum operator of the electron is

2)

$$\underline{\hat{S}}\,\psi = \frac{\hbar}{2}\,\underline{\hat{\sigma}}\,\psi \quad -(5)$$

Therefore as is well known, the g factor of the electron in the Dirac theory is:

$$g = 2. \quad -(6)$$

In fluid electrodynamics there is an additional material vector potential:

$$\underline{W}_1 = \frac{m}{e}\,\underline{v}(\text{vac}) \quad -(7)$$

where $\underline{v}$ (vac) is the velocity field of the vacuum, or spacetime, or aether. Therefore the minimal prescription becomes:

$$\underline{p} \rightarrow \underline{p} - e\left(\underline{W} + \underline{W}_1\right) \quad -(8)$$

Let:

$$\underline{W}_1 = x\,\underline{W} \quad -(9)$$

then the hamiltonian (1) is changed to:

$$\begin{aligned}\hat{H}_2\,\psi &= \frac{e}{2m}\left(i\,\underline{\sigma}\cdot\underline{p}\times\left(\underline{W} + \underline{W}_1\right)\right)\psi \\ &= \frac{e}{2m}(1+x)\,i\,\underline{\sigma}\cdot\underline{p}\times\underline{W}\,\psi \\ &= -\frac{e}{2m}(1+x)\left(2\,\underline{S}\cdot\underline{B}\right)\psi\end{aligned} \quad -(9)$$

3) The g factor of the electron is therefore changed to

$$\boxed{g = 2(1+x)} \quad -(10)$$

The experimentally observed value is:

$$g = 2.002319314 \quad -(11)$$

so

$$\boxed{x = 0.002319314} \quad -(12)$$

From eq. (7):

$$\underline{B}_1 = \frac{m}{e}\,\underline{\nabla}\times\underline{v}(\text{vac}) = \frac{m}{e}\,\underline{w}(\text{vac}) = x\,\underline{B} \quad -(13)$$

where

$$\underline{w}(\text{vac}) = \underline{\nabla}\times\underline{v}(\text{vac}) \quad -(14)$$

is the vorticity of the fluid spacetime. Finally assume that:

$$\underline{B} = B_Z\,\underline{k} \quad -(15)$$

to find that

$$\boxed{\begin{aligned} x &= \frac{m}{e}\,\frac{w_Z(\text{vac})}{B_Z} \\ &= 0.002319314 \end{aligned}} \quad -(16)$$

Therefore the anomalous g factor of the electron is explained by the vacuum vorticity Q.E.D.

4) From standard laboratory data:

$$m = 9.10953 \times 10^{-31}\ \text{kg} \quad -(17)$$

$$-e = 1.60219 \times 10^{-19}\ C \quad -(18)$$

so

$$\frac{m}{e} = -5.68567 \times 10^{-12}\ \text{kgm}\ C^{-1} \quad -(19)$$

If it is assumed that:

$$B_Z = 1\ \text{tesla} \quad -(20)$$

then

$$x = -5.68567 \times 10^{-12}\ w_Z(\text{vac}) \quad -(21)$$

$$= 0.002319314$$

so

$$\boxed{w_Z(\text{vac}) = -4.07923 \times 10^{8}\ s^{-1}} \quad -(22)$$

In general:

$$\boxed{w_Z(\text{vac}) = 0.002319314\ \frac{e}{m}\ B_Z} \quad -(23)$$

This result implies that a static magnetic field aligned in the Z axis generates a vortex in the fluid spacetime surrounding it. This explains the anomalous g factor of the electron in a far simpler and more powerful manner than quantum electrodynamics.