385(1): Conservation of Antisymmetry in ECE2 Electrostatics

The scalar antisymmetry law is:

$$\underline{E} = -\underline{\nabla}\phi + \underline{\omega}\phi = -\frac{\partial \underline{A}}{\partial t} - \omega_0 \underline{A} \quad -(1)$$

where $\underline{E}$ is the electric field strength, ϕ is the scalar potential, $\underline{\omega}$ is the spin connection vector and ω_0 the time-like spin connection component. For electrostatics assume that:

$$\frac{\partial \underline{A}}{\partial t} = \underline{0} \quad -(2)$$

so

$$\underline{E} = -\omega_0 \underline{A}. \quad -(3)$$

Assume that ω_0 is universal and so is the same for electrostatics and gravitostatics:

$$\omega_0 = -\frac{c}{r}. \quad -(4)$$

Assume that $\underline{E}$ is the experimentally observed Coulombic electric field strength:

$$\underline{E} = -\frac{e^2}{4\pi\epsilon_0}\frac{\underline{r}}{r^3} \quad -(5)$$

where e is the charge on the proton and ϵ_0 the S.I. vacuum permittivity.

It follows that:

$$\underline{A} = -\frac{e^2}{4\pi\epsilon_0 c}\frac{\underline{r}}{r^2}. \quad -(6)$$

Note carefully that the ECE2 electrostatic vector potential $\underline{A}$ does not exist in the standard model.

If electrostatics be defined by the absence of a

2) magnetic flux density $\underline{B}$ then:

$$\underline{B} = \underline{\nabla} \times \underline{A} - \underline{\omega} \times \underline{A} = \underline{0} \quad -(7)$$

The vector antisymmetry law of ECE2 unified field theory implies that:

$$\frac{\partial A_Z}{\partial Y} + \frac{\partial A_Y}{\partial Z} = \omega_Y A_Z + \omega_Z A_Y \quad -(8)$$

$$\frac{\partial A_X}{\partial Z} + \frac{\partial A_Z}{\partial X} = \omega_Z A_X + \omega_X A_Z \quad -(9)$$

$$\frac{\partial A_Y}{\partial X} + \frac{\partial A_X}{\partial Y} = \omega_X A_Y + \omega_Y A_X \quad -(10)$$

Eq. (7) implies:

$$\frac{\partial A_Z}{\partial Y} - \frac{\partial A_Y}{\partial Z} = \omega_Y A_Z - \omega_Z A_Y \quad -(11)$$

$$\frac{\partial A_X}{\partial Z} - \frac{\partial A_Z}{\partial X} = \omega_Z A_X - \omega_X A_Z \quad -(12)$$

$$\frac{\partial A_Y}{\partial X} - \frac{\partial A_X}{\partial Y} = \omega_X A_Y - \omega_Y A_X \quad -(13)$$

Add and subtract eqs. (8) and (11):

$$\frac{\partial A_Z}{\partial Y} = \omega_Y A_Z, \quad \frac{\partial A_Y}{\partial Z} = \omega_Z A_Y \quad -(14)$$

Add and subtract eqs. (9) and (12):

$$\frac{\partial A_X}{\partial Z} = \omega_Z A_X, \quad \frac{\partial A_Z}{\partial X} = \omega_X A_Z \quad -(15)$$

Add and subtract eqs. (10) and (13):

$$\frac{\partial A_Y}{\partial X} = \omega_X A_Y, \quad \frac{\partial A_X}{\partial Y} = \omega_Y A_X \quad -(16)$$

3) For the Coulomb potential:

$$\underline{A} = -\frac{e^2}{4\pi\epsilon_0 c}\frac{(X\underline{i} + Y\underline{j} + Z\underline{k})}{X^2+Y^2+Z^2} \quad -(17)$$

so

$$A_X = -\frac{e^2}{4\pi\epsilon_0 c}\frac{X}{X^2+Y^2+Z^2} \quad -(18)$$

and so on.

It follows, for example, that:

$$\frac{\partial A_Z}{\partial Y} = \frac{e^2}{4\pi\epsilon_0 c}\frac{2YZ}{(X^2+Y^2+Z^2)^2}$$

$$= \omega_Y A_Z \quad -(19)$$

$$= -\frac{e^2}{4\pi\epsilon_0 c}\,\omega_Y\,\frac{Z}{(X^2+Y^2+Z^2)}$$

so

$$\omega_Y = -\frac{2Y}{X^2+Y^2+Z^2} \quad -(20)$$

Similarly:

$$\omega_Z = -\frac{2Z}{X^2+Y^2+Z^2} \quad -(21)$$

$$\omega_X = -\frac{2X}{X^2+Y^2+Z^2} \quad -(22)$$

So

$$\boxed{\underline{\omega} = -2\frac{\underline{r}}{r^2}} \quad -(23)$$

and

$$\omega^\mu = -\left(\frac{1}{r}, \frac{2\underline{r}}{r^2}\right) \quad -(24)$$

4) This is the same result as for Newtonian gravitation, Q.E.D.

Finally the scalar potential is:

$$\phi = \frac{e}{4\pi\epsilon_0 r} \quad - (25)$$

which has the opposite sign to the standard model.

Note carefully that ECE2 electrostatics conserves antisymmetry under the assumptions (2) and (7). In UFT 131 ff. it was shown that the U(1) gauge theory of standard model electrodynamics collapses entirely when subjected to the rigorous constraints of antisymmetry. The latter is the fundamental antisymmetry of the field tensor.