1) 68(2): Resonance Equation for Counter - Gravitation

It was shown in note 68(1) that the effect of gravitation on Coulomb's law is to introduce the extra term:

$$\underline{\nabla} \cdot \underline{E}^a = -\phi \left(\omega^a{}_{1b} T^{b10} + \omega^a{}_{2b} T^{b20} + \omega^a{}_{3b} T^{b30} \right) \quad -(1)$$

which can be written as:

$$\underline{\nabla} \cdot \underline{E}^a = -\left(\underline{\omega}^a{}_b\right)_{int} \cdot \underline{E}^b \quad -(2)$$

where:

$$\left(\underline{\omega}^a{}_b\right)_{int} \cdot \underline{E}^b \sim 0. \quad -(3)$$

Here $\left(\underline{\omega}^a{}_b\right)_{int}$ is the interaction spin connection. This is non-zero if and only if there is interaction between the electromagnetic and gravitational fields.

If the a and b indices are assumed to be the same, for simplicity of argument, ~~then~~ then eq (2) in its simplest form is:

$$\underline{\nabla} \cdot \underline{E} = -\underline{\omega}_{int} \cdot \underline{E} \quad -(4)$$

2)

In paper 63 it was shown that:

$$\underline{E} = -(\underline{\nabla} + \underline{\omega})\phi \quad -(5)$$

where:

$$\omega_r = -\frac{1}{r} \quad -(6)$$

is the spin connection in the absence of interaction between the electromagnetic and gravitational fields. This led to the resonance equation:

$$\frac{d^2\phi}{dr^2} + \frac{1}{r}\frac{d\phi}{dr} - \frac{1}{r^2}\phi = -\rho/\epsilon_0 \quad -(7)$$

From eq. (4), eq. (7) is changed to:

$$\frac{d^2\phi}{dr^2} + \frac{1}{r}\frac{d\phi}{dr} - \frac{1}{r^2}\phi - \underline{\omega}_{int} \cdot (\underline{\nabla} + \underline{\omega})\phi$$

$$= -\rho/\epsilon_0 \quad -(8)$$

in the presence of interaction. Eq. (8) is:

$$\boxed{\frac{d^2\phi}{dr^2} + \left(\frac{1}{r} - \omega_{r,int}\right)\frac{d\phi}{dr} - \left(\frac{1}{r^2} + \frac{\omega_{r,int}}{r}\right)\phi = -\rho/\epsilon_0}$$

3.) Resonant counter-gravitation works by amplifying ϕ at resonance from eq. (9). ~~that~~ the

It is seen from eq. (1) ~~that~~ the interaction term is amplified, meaning that the electric field has maximum effect on the gravitational field. Finally, from eq. (8) of notes 68(1), the Newtonian force and acceleration due to gravity is maximized or minimized. This depends on the sign of $\underline{E}$.