153(14): Fuller Development of Counter-Gravitational Theory.

The gravitational field is defined by:

$$F = mg = m\ddot{r} \quad -(1)$$

and resonance in r occurs at:

$$r = \frac{A\cos\omega t}{\omega_0^2 - \omega^2} \quad -(2)$$

So:

$$\dot{r} = -\frac{\omega A \sin\omega t}{\omega_0^2 - \omega^2} \quad -(3)$$

$$\ddot{r} = -\left(\frac{\omega^2}{\omega_0^2 - \omega^2}\right) A\cos\omega t \quad -(4)$$

$$\boxed{F = -\left(\frac{\omega^2}{\omega_0^2 - \omega^2}\right) m A\cos\omega t} \quad -(5)$$

If

$$\boxed{\omega_0 = \omega} \quad -(6)$$

$$\boxed{F \rightarrow -\infty} \quad -(7)$$

For practical applications the alternating electric field must be used in such a way as to maximize resonance in g opposite to the Earth's g.

The system must have a natural frequency ω_0 in it, defined by:

$$\omega_0^2 = \frac{k}{m} \quad -(8)$$

2) where k is the Hooke constant.

The equivalence principle is:

$$F = mg = -\frac{mMG}{r^2} \quad -(9)$$

This was derived in previous work from ECE anti-symmetry. For convenience, define the gravitational potential as:

$$\Phi^\mu = \left(\Phi, c\,\underline{\Phi} \right) \quad -(10)$$

and the electromagnetic potential as:

$$A^\mu = \left(\phi, c\,\underline{A} \right) \quad -(11)$$

then:

$$\underline{E} = -\underline{\nabla}\phi - \frac{\partial \underline{A}}{\partial t} + \phi\,\underline{\omega}_E - \omega_E\,\underline{A} \quad -(12)$$

$$\underline{g} = -\underline{\nabla}\,\Phi - \frac{\partial \underline{\Phi}}{\partial t} + \phi\,\underline{\omega}_g - \omega_g\,\underline{\Phi} \quad -(13)$$

in ECE theory, where:

$$\omega_E^\mu = \left(\omega_E, \underline{\omega}_E \right) \quad -(14)$$

$$\omega_g^\mu = \left(\omega_g, \underline{\omega}_g \right) \quad -(15)$$

are the spin connections. In the standard model:

$$\underline{E} = -\underline{\nabla}\phi - \frac{\partial \underline{A}}{\partial t} \quad -(16)$$

$$\underline{g} = -\underline{\nabla}\,\Phi - \frac{\partial \underline{\Phi}}{\partial t} \quad -(17)$$

and $\underline{\Phi}$ is also omitted, so:

$$\underline{g} \overset{?}{=} -\underline{\nabla}\,\Phi \quad -(18)$$

3) However, ECE antisymmetry means, in the standard model:

$$\underline{\nabla}\,\Phi = \frac{\partial \Phi}{\partial t} \quad -(19)$$

$$\underline{\nabla}\,\phi = \frac{\partial A}{\partial t} \quad -(20)$$

as shown in previous papers. So:

$$F = mg = -m\frac{\partial \Phi}{\partial r} = -m\left|\frac{\partial \Phi}{\partial t}\right| \quad -(21)$$

The gravitational potential is:

$$\Phi = -\frac{MG}{r} \quad -(22)$$

so:

$$\boxed{F = mg = -\frac{mMG}{r^2}} \quad -(23)$$

QED. The equivalence principle has been derived from Cartan geometry and antisymmetry of the commutator of covariant derivatives. This verifies ECE experimentally to many orders of magnitude precision.

Similarly the electric equivalence principle is

$$F = e_1 E = -\frac{e_1 e_2}{4\pi\epsilon_0 r^2} \quad -(24)$$

and this again verifies ECE to many orders of magnitude precision. Eqn. (24) derives the equivalence of the Lorentz force $e_1 E$ and Coulomb force, which is $-e_1 e_2 / (4\pi\epsilon_0 r^2)$.