INFINITE ENERGY FROM SPACETIME

by

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ABSTRACT

It is shown using two independent methods that ECE2 theory produces from spacetime (aether or vacuum) peaks of infinite amplitude in electric field strength. The first method uses Euler Bernoulli resonance to amplify the well known vacuum fluctuations of lamb shift theory and the second method shows that such peaks of infinite amplitude can be produced from a tensor Taylor expansion.

Keywords: ECE2 theory, infinite peaks of electric field strength from the vacuum.

UFT 399

1. INTRODUCTION

In recent papers of this series {1 - 49} a Tensor Taylor series method was used to describe the spatially averaged influence of spacetime, the vacuum or aether, on a well designed circuit. Spatial averages were computed to order six and further using computer algebra. In the immediately preceding paper (UFT398 on www.aias.us) higher order corrections to the Lamb shift were calculated using this new method, based on computer algebra, and it was shown that the lamb shift can be considerably affected if the radiation volume becomes small. In Section 2 of this paper it is shown that infinite peaks in electric field strength can be engineered from the vacuum. Two methods are used, one based on Euler Bernoulli resonance, and the other on a tensor Taylor series method applied to the definition of electric field strength E in ECE2 theory.

This paper is a short synopsis of detailed calculations described in the notes accompanying UFT399 on www.aias.us. Note 399(1) describes the Euler Bernoulli method and Notes 399(2) and 399(3) are used to show that infinite peaks can emerge from the fundamental definition of the electric field strength as described in Section 3. The latter is a summary of computational methods and graphics.

2. PEAKS OF ELECTRIC FIELD STRENGTH E FROM THE VACUUM

Consider the well known assumption of Lamb shift theory that vacuum fluctuations are described by:

$$\delta \underline{r} = \delta \underline{r}(0) e^{-i\omega_0 t} \quad -(1)$$

where ω_0 is a characteristic angular frequency. The force is defined by:

$$\underline{F}(\underline{r}) = -m\omega_0^2 \delta \underline{r} = m \frac{d^2 \delta \underline{r}}{dt^2} = -e\underline{E}(\text{vac}) \quad -(2)$$

where $\underline{E}(\text{vac})$ is the fluctuating vacuum electric field strength. Therefore:

$$\underline{E}(\text{vac}) = \frac{m}{e}\,\omega_0^2\,\delta\underline{r}(0)\,e^{-i\omega_0 t} \quad -(3)$$

However, in ECE2 theory:

$$\underline{E}(\text{vac}) = \underline{\omega}\,\phi_0 \quad -(4)$$

where $\underline{\omega}$ is the spin connection vector and ϕ_0 is the electromagnetic potential in the absence of the vacuum. So:

$$\underline{\omega}\,\phi_0 = \frac{m}{e}\,\omega_0^2\,\delta\underline{r}(0)\,e^{-i\omega_0 t} \quad -(5)$$

and:

$$\frac{\partial^2}{\partial t^2}\left(\underline{\omega}\,\phi_0\right) = \frac{m}{e}\,\omega_0^4\,\delta\underline{r}(0)\,e^{-i\omega_0 t} \quad -(6)$$
$$:= \underline{A}\,e^{-i\omega_0 t}$$

where the constant $\underline{A}$ is defined as:

$$\underline{A} := \frac{m}{e}\,\omega_0^4\,\delta\underline{r}(0) = \text{constant}. \quad -(7)$$

Therefore:

$$\underline{\omega}\frac{\partial^2\phi_0}{\partial t^2} + 2\frac{\partial\phi_0}{\partial t}\frac{\partial\underline{\omega}}{\partial t} + \left(\frac{\partial^2\underline{\omega}}{\partial t^2}\right)\phi_0 = \underline{A}\,e^{-i\omega_0 t} \quad -(8)$$

whose X component is:

$$\frac{\partial^2\phi_0}{\partial t^2} + \frac{2}{\omega_X}\frac{\partial\omega_X}{\partial t}\frac{\partial\phi_0}{\partial t} + \frac{1}{\omega_X}\frac{\partial^2\omega_X}{\partial t^2}\phi_0 = \frac{A_X}{\omega_X}\,e^{-i\omega_0 t} \quad -(9)$$

and similarly for Y and Z.

For Euler Bernoulli resonance to occur Eq. (9) has to be in the format:

$$\ddot{x} + 2\beta\dot{x} + \omega_1^2 x = A\cos\omega_0 t \quad -(10)$$

so:

$$\frac{\partial \omega_x}{\partial t} = \beta\omega_x \quad -(11)$$

and

$$\omega_1^2 = \frac{1}{\omega_x}\frac{\partial^2 \omega_x}{\partial t^2}. \quad -(12)$$

It follows that:

$$\omega_x = \omega(0)\exp\left(i\left(\omega_1 t - \underline{\kappa}\cdot\underline{r}\right)\right) \quad -(13)$$

a solution of which is:

$$\frac{\partial \omega_x}{\partial t} = i\omega(0)\omega_x. \quad -(14)$$

From this solution, β is pure imaginary so its real and physical part is zero. So Eq. (9)

becomes:

$$\frac{\partial^2 \phi_0}{\partial t^2} + \omega_1^2\phi_0 = A_x\omega(0)\exp\left(-i\left(\omega_0 t + \omega_1 t - \underline{\kappa}\cdot\underline{r}\right)\right) \quad -(15)$$

whose real part is:

$$\frac{\partial^2 \phi_0}{\partial t^2} + \omega_1^2\phi_0 = A_x\omega(0)\cos\left((\omega_0 + \omega_1)t - \underline{\kappa}\cdot\underline{r}\right). \quad -(16)$$

The usual Euler Bernoulli structure is:

$$\frac{\partial^2 \phi_0}{\partial t^2} + \omega_1^2\phi_0 = A\cos\omega_0 t \quad -(17)$$

and at:

$$\omega_0 = \omega_1 \quad -(18)$$

the potential becomes infinite. This is Euler Bernoulli resonance.

Eq. (16) reduces to Eq. (17) when:

$$\underline{k} \cdot \underline{r} := \omega_2 t \quad -(19)$$

so Euler Bernoulli resonance occurs at:

$$\omega_0 = \omega_2 \quad -(20)$$

and infinite potential energy is taken from the vacuum. The driving force for the Euler Bernoulli resonance is the well known vacuum fluctuation of the lamb shift theory. In Section 3 it is shown how the spin connection can be engineered for Euler Bernoulli resonance of this type.

As described in immediately preceding papers the experimentally observed electromagnetic potential is:

$$\phi(\underline{r} + \delta\underline{r}) = \phi(\underline{r}) + \phi(\text{vac}) \quad -(21)$$

where $\phi(\underline{r})$ is the potential in the absence of the vacuum and $\phi(\text{vac})$ is the vacuum potential:

$$\phi(\text{vac}) = \Delta\phi = \phi(\underline{r} + \delta\underline{r}) - \phi(\underline{r}). \quad -(22)$$

Using a tensorial Taylor series expansion and isotropic averaging:

$$\langle \Delta\phi \rangle = \langle \Delta\phi \rangle^{(2)} + \langle \Delta\phi \rangle^{(4)} + \langle \Delta\phi \rangle^{(6)} + \cdots \quad -(23)$$

in which:

$$\langle \Delta\phi \rangle^{(2)} = \frac{1}{6} \langle \underline{\delta r} \cdot \underline{\delta r} \rangle \nabla^2 \phi(\underline{r}) \quad -(24)$$

$$\langle \Delta\phi \rangle^{(4)} = \frac{1}{216} \langle (\underline{\delta r} \cdot \underline{\delta r})^2 \rangle \left(\frac{\partial^4 \phi(\underline{r})}{\partial x^4} + \frac{\partial^4 \phi(\underline{r})}{\partial y^4} + \frac{\partial^4 \phi(\underline{r})}{\partial z^4} + 6 \left(\frac{\partial^4 \phi(\underline{r})}{\partial y^2 \partial z^2} + \frac{\partial^4 \phi(\underline{r})}{\partial x^2 \partial z^2} + \frac{\partial^4 \phi(\underline{r})}{\partial x^2 \partial y^2} \right) \right) \quad -(25)$$

$$\langle \Delta\phi \rangle^{(6)} = \frac{\langle (\underline{\delta r} \cdot \underline{\delta r})^3 \rangle}{19440} \left(\frac{\partial^6 \phi(\underline{r})}{\partial x^6} + \frac{\partial^6 \phi(\underline{r})}{\partial y^6} + \frac{\partial^6 \phi(\underline{r})}{\partial z^6} + 15 \left(\frac{\partial^6 \phi(\underline{r})}{\partial y^4 \partial z^2} + \frac{\partial^6 \phi(\underline{r})}{\partial y^2 \partial z^4} + \frac{\partial^6 \phi(\underline{r})}{\partial x^4 \partial z^2} + \frac{\partial^6 \phi(\underline{r})}{\partial x^4 \partial y^2} + \frac{\partial^6 \phi(\underline{r})}{\partial x^2 \partial z^4} + \frac{\partial^6 \phi(\underline{r})}{\partial x^2 \partial y^4} \right) + 90 \frac{\partial^6 \phi(\underline{r})}{\partial x^2 \partial y^2 \partial z^2} \right) \quad -(26)$$

Similarly, the vacuum electric field strength is:

$$\underline{E}(vac) = \Delta \underline{E} = \underline{E}(\underline{r} + \underline{\delta r}) - \underline{E}(\underline{r}) \quad -(27)$$

so:

$$\underline{E}(vac) = \langle \Delta \underline{E} \rangle^{(2)} + \langle \Delta \underline{E} \rangle^{(4)} + \langle \Delta \underline{E} \rangle^{(6)} + \cdots \quad -(28)$$

Firstly consider the sum to second order:

$$\phi(vac) = \frac{1}{6} \langle \underline{\delta r} \cdot \underline{\delta r} \rangle \nabla^2 \phi(\underline{r}) + \cdots \quad -(29)$$

and:

$$\underline{E}(\text{vac}) = \frac{1}{6}\langle \delta\underline{r}\cdot\delta\underline{r}\rangle \left(\nabla^2 E_X \underline{i} + \nabla^2 E_Y \underline{j} + \nabla^2 E_Z \underline{k}\right). \quad -(30)$$

It follows that:

$$\frac{E_X(\text{vac})}{\phi(\text{vac})} = \frac{\nabla^2 E_X(\underline{r})}{\nabla^2 \phi(\underline{r})} \quad -(31)$$

and similarly for the Y and Z components.

The ratio (31) eliminates $\langle \delta\underline{r}\cdot\delta\underline{r}\rangle$, so it does not have to be calculated.

In ECE2 theory {1 - 41}:

$$\underline{E} = -\underline{\nabla}\phi + \underline{\omega}\phi \quad -(32)$$

which can be interpreted as:

$$\underline{E}(\underline{r}+\delta\underline{r}) = \underline{E}(\underline{r}) + \underline{E}(\text{vac}) \quad -(33)$$

in which:

$$\underline{E}(\underline{r}) = -\underline{\nabla}\phi(\underline{r}) \quad -(34)$$

and:

$$\underline{E}(\text{vac}) = \underline{\omega}\,\phi(\text{vac}). \quad -(35)$$

It follows from Eq. (35) that:

$$\omega_X = \frac{E_X(\text{vac})}{\phi_X(\text{vac})} = \frac{\nabla^2 E_X(\underline{r})}{\nabla^2 \phi(\underline{r})} \quad -(36)$$

with similar expressions for the Y and Z components. Now use the Poisson equation:

$$\nabla^2 \phi = -\rho / \epsilon_0 \quad -(37)$$

where ρ is the material charge density and ϵ_0 is the vacuum permittivity, and ϕ is the potential in the absence of the vacuum. The highly developed methods of solution of the Poisson equation {1 - 41} can be used to compute ϕ for any given charge density.

Finally:

$$\underline{E}(\underline{r}) = -\underline{\nabla}\phi(\underline{r}) \quad -(38)$$

can be found, and the three spin connection components exemplified by Eq. (36).

In Section 3 it is shown that solutions given by this method can produce infinite energy from the vacuum. Section 3 also extends the method to the general case;

$$\langle \underline{E}(vac) \rangle = \underline{\omega} \langle \phi(vac) \rangle \quad -(39)$$

and:

$$\langle \underline{E}(vac) \rangle = \langle \underline{E}(vac) \rangle^{(2)} + \langle \underline{E}(vac) \rangle^{(4)} + \langle \underline{E}(vac) \rangle^{(6)} + \cdots$$

$$\langle \phi(vac) \rangle = \langle \phi(vac) \rangle^{(2)} + \langle \phi(vac) \rangle^{(4)} + \langle \phi(vac) \rangle^{(6)} + \cdots \quad -(40)$$

and gives the general using computer algebra.

3. SOLUTIONS AND NUMERICAL ANALYSIS

Section by co author Horst Eckardt

Infinite energy from spacetime

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3 Solutions and numerical analysis

3.1 Energy by Euler-Bernoulli resonance

Extending the calculation of the Euler-Bernoulli resonance in section 2, we start with Eq. (12):

$$\frac{\partial^2 \omega_X}{\partial t^2} = \omega_X \omega_1^2 \tag{41}$$

where ω_X is the X component of the spin connection and ω_1 is a constant defined in (10). A real solution of this differential equation is

$$\omega_X = \omega_{0X} \exp(-\omega_1 t + kX) \tag{42}$$

with a constant ω_{0X}. Inserting this into Eq. (9) gives

$$\frac{\partial \phi_0^2}{\partial t^2} - 2\omega_1 \frac{\partial \phi_0}{\partial t} + {\omega_1}^2 \phi_0 = \frac{A_x}{\omega_{0X}} \exp(\omega_1 t - i\omega_0 t - kX). \tag{43}$$

This differential equation can be solved for ϕ_0, giving

$$\phi_0(t) = (c_1 + c_2 t) \exp(\omega_1 t) - \frac{A_X}{\omega_0^2 \omega_{0X}} \exp(\omega_1 t - i\omega_0 t - kX) \tag{44}$$

with integration constants c_1 and c_2. Even with both constants being zero, this is an exponentially growing function in t. The term kX in (42) can even be omitted to remove any space dependence. Then the solution of (43) is

$$\phi_0(t) = (c_1 + c_2 t) \exp(\omega_1 t) - \frac{A_X}{\omega_0^2 \omega_{0X}} \exp(\omega_1 t - i\omega_0 t). \tag{45}$$

This means that a time-oscillating vacuum field (5),

$$\mathbf{E}(vac) = \frac{m}{e} \omega_0^2 \, \delta\mathbf{r}(0) \exp(-i\omega_0 t), \tag{46}$$

leads to an extra potential in the Lamb shift volume growing over all limits. This is an example for converting spacetime curvature to energy.

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3.2 Energy from a tensor Taylor expansion

We develop an example for the method based on the Taylor expansion of terms in the Lamb shift vacuum as presented in Eqs. (21-40). We assume a vacuum charge density oscillating in space on the X axis of a coordinate system:

$$\rho(X) = \rho_0 \cos(kX). \tag{47}$$

The Poisson equation

$$\frac{\partial^2 \phi}{\partial X^2} = -\frac{\rho_0}{\epsilon_0} \tag{48}$$

then has the solution

$$\phi = \frac{\rho_0 \cos(kX)}{\epsilon_0 k^2} + c_1 + c_2 X \tag{49}$$

with integration constants c_1 and c_2. The corresponding electric field strength is

$$\mathbf{E}_X = -\frac{\partial \phi}{\partial X} = \frac{\rho_0 \sin(kX)}{\epsilon_0 k} - c_2. \tag{50}$$

From Eqs. (39,40) follows for the X component of the spin connection:

$$\omega_X = \frac{E_X(vac)}{\phi(vac)} = \frac{E_X(vac)^{(2)} + E_X(vac)^{(4)} + E_X(vac)^{(6)} + ...}{\phi(vac)^{(2)} + \phi(vac)^{(4)} + \phi(vac)^{(6)} + ...} \tag{51}$$

where $E_X(vac)$ and $\phi(vac)$ are given by Eqs. (29) and (30). In our case all even (and odd) derivatives of E_X and ϕ are of the form

$$\frac{\partial^n E_X}{\partial X^n} = a_n \sin(kX) \tag{52}$$

and

$$\frac{\partial^n \phi}{\partial X^n} = b_n \cos(kX) \tag{53}$$

with coefficients $b_n = k\, a_n$ so that insertion of (29,30) into (51) leads to the same factor sum of $< \delta r \cdot \delta r >$ in the numerator and denominator. Therefore the spin connection expression can be reduced to he simple result

$$\omega_X = k \tan(kX) \tag{54}$$

which holds for alle degrees of approximation. Since the tangent function has poles at multiples of $\pi/2$, there are infinities of ω_x for $kX = n\pi/2$. Infinite energy can be extracted at these points in the Lamb shift volume.

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