

8.4 Intrinsic structure of fields

In this chapter, we have described the unification between electrodynamics, mechanics and fluid dynamics. In Example 8.13, we saw that Newton's law of gravitation and the Coulomb law are formally identical. They can both be described by Kambe's divergence equation (8.69):

$$\nabla \cdot \mathbf{E}_F = q_F, \quad (8.377)$$

which is an interpretation of both laws by fluid dynamics. \mathbf{E}_F is the flow field and q_F is a source or sink of the flow. Consequently, electric and gravitational fields should have an internal flow structure. In ECE theory, both fields are defined in equivalent form by the potentials and spin connections: Eq. (4.211),

$$\mathbf{E} = -\nabla\phi - \frac{\partial \mathbf{A}}{\partial t} - c\omega_{0e}\mathbf{A} + \omega_e\phi, \quad (8.378)$$

for the electric case, and Eq. (7.38),

$$\mathbf{g} = -\nabla\Phi - \frac{\partial \mathbf{Q}}{\partial t} - c\omega_{0g}\mathbf{Q} + \omega_g\Phi, \quad (8.379)$$

for the gravitational case. We have discerned the spin connections in both equations by the indices e and g and omitted the polarization indices. In our interpretation of potentials, \mathbf{A} and \mathbf{Q} are aether flows. In particular, \mathbf{Q} has the units of m/s and was handled as a velocity in our exemplary considerations. In the above equations, we see that there are two contributions from the vector potentials: one of their time derivative and one that is directly proportional to them. The time derivatives are also used in standard physics, but the direct contributions (multiplied by a spin connection) are appearing only in ECE theory. In the static case, the Coulomb and gravitational fields read

$$\mathbf{E} = -\nabla\phi - c\omega_{0e}\mathbf{A} + \omega_e\phi \quad (8.380)$$

and

$$\mathbf{g} = -\nabla\Phi - c\omega_{0g}\mathbf{Q} + \omega_g\Phi. \quad (8.381)$$

The scalar potentials ϕ and Φ contribute linearly also. In the fluid dynamics interpretation of spacetime, they can be considered as terms of aether pressure. We see that both types of potentials (scalar and vector potentials) are present in static fields of electrodynamics and gravitation. This is a result that cannot be obtained from standard physics.

The fields (8.380, 8.381) can further be simplified by applying the antisymmetry laws (5.24) and (7.59)):

$$-\frac{\partial \mathbf{A}}{\partial t} + \nabla\phi - c\omega_{0e}\mathbf{A} - \omega_e\phi = \mathbf{0}, \quad (8.382)$$

$$-\frac{\partial \mathbf{Q}}{\partial t} + \nabla\Phi - c\omega_{0g}\mathbf{Q} - \omega_g\Phi = \mathbf{0}, \quad (8.383)$$

giving in the static case for \mathbf{E} and \mathbf{g} :

$$\mathbf{E} = -2c\omega_{0e}\mathbf{A}, \quad (8.384)$$

$$\mathbf{g} = -2c\omega_{0g}\mathbf{Q}. \quad (8.385)$$

The formula for the electric field was already derived in Example 8.4. The vector potential \mathbf{A} corresponds directly to velocity field \mathbf{v} via the ratio x between mass and charge density in the vacuum (see Eqs. (8.209, 8.216)):

$$\mathbf{E} = -2cx\omega_0\mathbf{v}. \quad (8.386)$$

Thus, both equations (8.384) and (8.385) refer to an aether flow directly.

The interpretation of static fields as flow fields is not new. Nicola Tesla argued in that direction, and Thomas Bearden [88] interpreted the field of an electric charge to be an output flux of aether material. If there is a current of aether output flux, there must also be an input flux, otherwise the continuity equation would be violated. We know that charges are always connected with matter, see for example the famous ratio e/m for electrons. So, when there is an output flux of the electric field, the input flux must be realized by additional aether material, which can only represent a gravitational field (see Fig. 8.39). The gravitational field is nothing else than a backflow caused by electromagnetic effects. Because both flow types are different, there must be different structures of “aether particles” or, more plausible, “aether compounds”, that belong to an electric and a gravitational aether flux. This research subject is unexplored so far. There are only hints of some authors on a philosophical level that such structures should exist (see, for example, [98]).

We obtain the remarkable result that static fields are solely determined by the vector potentials or spacetime flows. The pre-factors have the dimension of a time frequency. This may be a hint that the fields are connected with quantum states, in analogy to the quantum energy $\hbar\omega$.

We can develop these hypothetical considerations further. In Eqs. (8.384, 8.385), the spin connections represent a wave number, or, with the factor c included, an angular velocity (or time frequency). This may be interpreted as the internal structure of aether compounds making up the flows. According to state-of-the-art quantum electrodynamics, photons mediate the electromagnetic interaction, and gravitons mediate the gravitational field. The quantum energy of photons is $\hbar\omega$ which gives us an interpretation of the spin connection ω_{0e} in Eq. (8.384). The quantum energy of the mediating photon then is

$$E_e = \hbar c \omega_{0e}, \quad (8.387)$$

and that of the mediating graviton is

$$E_g = \hbar c \omega_{0g}. \quad (8.388)$$

They will amount to very different values, because the electromagnetic and gravitational field energies differ by many orders of magnitude. Both intrinsic structures (photons and gravitons) represent radiation fields that are also present in neutral matter, because atoms and molecules contain internally covalent or ionic bonds, so they contain strong electric fields.

The knowledge the internal structure of fields allows us to construct an effect of counter gravitation. Assume that we know the internal frequency ω_{0g} of the graviton radiation of a body. We overlay this field with an electromagnetic radiation having the same frequency. Then, the electromagnetic field provides aether compounds of the type which is used for gravitation, and the external gravitational field of the earth cannot couple to the body. This has been depicted in Fig. 8.40. Such a process has indeed been realized experimentally already in the 1950ies [93]. It has been found that the frequency of graviton radiation is in the spectral range between microwave and infrared radiation, where the penetration depth into solids is largest. This effect is beyond the scope of standard physics. By ECE theory, however, we have found a possible explanation without need for quantum electrodynamics or other highly complicated theories.

In total, we have described three logical levels of fields:

- 1. force fields,
- 2. potentials,
- 3. intrinsic flow quanta.

This is a significant progress without using quantum-mechanical methods.

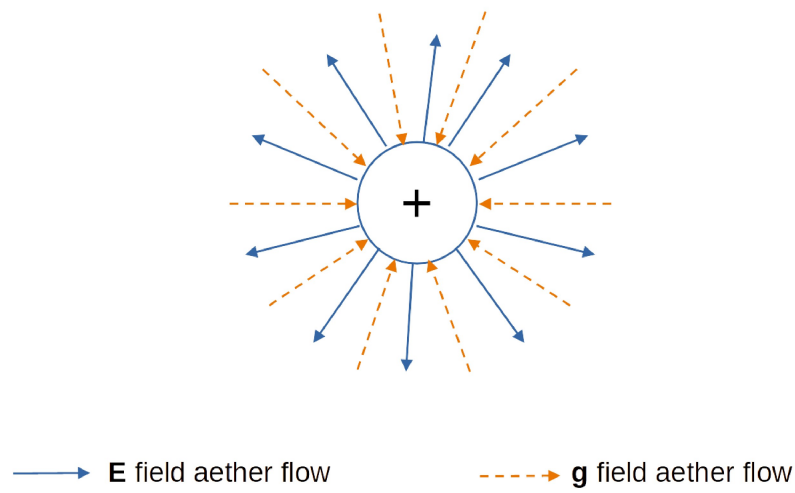


Figure 8.39: Aether fields of a source charge.

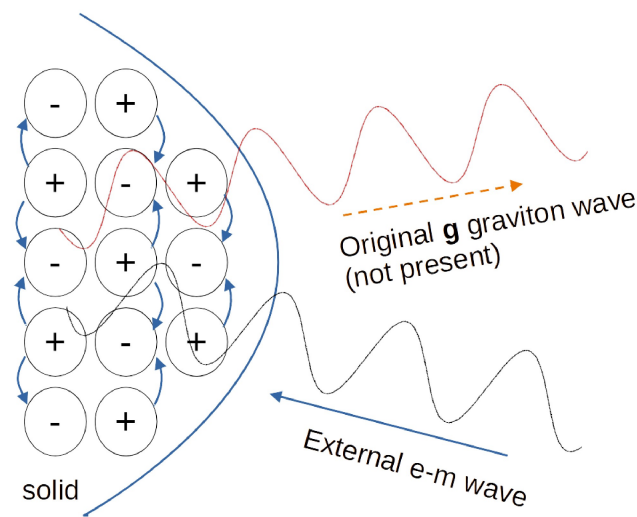


Figure 8.40: Replacement of a graviton wave by an electromagnetic wave (not all E fields drawn in solid).