Londons' Equation of Superconductivity

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Abstract: Londons' equation has been generalized for any number of dimensions. Next, an isotope equation has been explained.

Londons' equation of superconductivity has the shape:

$$\frac{mc^2}{4\pi ne^2}\,\Delta H \;=\; H$$

We have next:

$$m \;=\; \alpha|Q|$$

So

$$\beta\Delta H \;=\; Hm \qquad (*)$$

H and m are generally matrices 4x4
or in any case $n \times n \quad n \in N$.

It is necessary to generalize the Laplacian.
We have:

$$\begin{bmatrix} \frac{\partial^2}{\partial x_1^2} & 0 & 0 & & \\ 0 & \ddots & 0 & & \\ 0 & 0 & \frac{\partial^2}{\partial x_{n-1}^2} & & \\ & & & \frac{\partial^2}{\partial t^2} & \end{bmatrix}$$

Moreover,

$\frac{\partial^2}{\partial t \partial x_i}$ the mixed member with the sign "−"

$\frac{\partial^2}{\partial t \partial x_i}$ the mixed member with the sign "+"

$\frac{\partial^2}{\partial t^2}$ because $\partial t^2 \;=\; (-\partial t)(-\partial t)$.

We generalized the Laplacian for any number of dimensions:

$$m = [M]$$

Next we have:

$$\Delta(H - H_0) = (H - H_0)[M]$$

Since the exchange of phonons in the crystal lattice and the exchange of quanta in elementary particle physics are interactions, so:

a) we have the next proof of an existence of unempty vacuum
b) the interaction is superconductivity too, what is implicated by (*)

Moreover, we can justify an isotope equation:

$$M_i T^c = const \qquad (**)$$

It is implicated by (*).

If in the critical situation $\Delta H = 0$
and if we assume $H = \gamma + \delta T$,
we obtain (**).

In the equation:

$$\beta \left[\frac{\partial}{\partial_{ij}}\right]^2 H = \left[M_{ij}\right] H$$

H may be a matrix too, so we have a multiplication of matrices.

The particular case (**) is implicated by the fact, that:

$$H \sim T$$

because:

$$G = h - TS$$

and

$$H \sim G$$

h - enthalpy of the phase transition
S is continuous.

In the critical moment S = const. because the settlement is not kept already but it is not yet disturbed.

$H \sim G$ is logical, because the superconducting field is proportional to the field of free energy (because the superconductivity allows to think about freedom).