Charge Contribution to Einstein Equation

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ABSTRACT: At the beginning one has explained why the monomial masses attract and the monomial charges repulse. It has led to the modification of energy-momentum tensor at the right member of the Einstein equation.
Next, one has explained the contribution of the two-, three- and n-particles interactions to the tensor of masses.
It has been presented that the next tensor amendment creates convergent series and implicates an existence of the additional dimensions which corresponds to the additional and loop dimensions.
In the end it has presented what difference is between the interactions of masses and currents.

1. The monomial charges repulse and the masses with the same signs attract one another (and vice versa: the charges with different signs attract and masses with different signs repulse one another).The negative mass may exist when the complex mass exists.
   The geometric charge [1] can be treated as an exterior derivative. The existence of the geometric charge justifies an introduction of the charge tensor to the right member of the Einstein equation.
   The effects of attraction and repulsion are different in the cases of masses and charges, because the masses and the charges of other interactions curve the space-time in the opposite directions. They influence the curvature tensor (with different signs). We have the modified Einstein equation:

$$R_{ik} + g_{ik}\, g^{ik} R_{ik} \; = \; \alpha T_{ik} + \beta Q_{ik} + \gamma F_{ik} \qquad (1)$$

   Q modifies the energy-momentum tensor and the charges of other interactions than gravitational masses are taken with the opposite sign than the mass. It is interesting that although all interactions are equivalent to gravitation, the interactions described by the number of poles n > 1 give an opposite contribution to the tensor of charge.

The pure gravitation gives the opposite contribution to this tensor than electromagnetism, strong and all higher forms of interactions.

The tensor F describes the products of charges. It must be taken under consideration, because one charge curves the space-time in the different way than two charges do. The products of masses give other contributions to the space-time than the product of other charges. So masses with the same signs always attract mutually and the charges with the same signs repulse (and analogically the masses with different signs repulse and charges attract).

It is necessary to consider the two- and many-body effects in the Einstein equation, because one charge curves the space-time differently than two and many charges.

After all, two charges can repulse or attract and there is an effect of cooperation.

The number of such combinations is $\binom{n}{2}$ so more dimensions than 4 must be considered by the matrices in the Einstein equation. Certain number in the matrix representing tensor F the products of the electric charges and masses and strong charges (and so on) exists. So there are mixed interactions because of the products of charges representing different interactions.

All tensors in the equation (1) are symmetric.

The equation (1) can be written in the shape:

$$R_{ik} + g_{ik}\, g^{ik} R_{ik} = \alpha[T] + \beta[Q] + \sum_i \gamma_i\, F_i \tag{2}$$

Tensor F_i describes the interactions of (i + 1) charges. So the conjunction of three charges can be described as the interaction of three pairs and consider weaker collective effects arising from the triples. Next the considerations of n-charges manifest weaker and weaker collective features. The constants γ_i decrease rapidly, the series $[F_i]$ is rapidly convergent, but we pay for it the price of the fast growth in the number of dimensions of next matrices F_i, so and of the dimensions of the reality described by the Einstein equation. Nothing strange, there is but an infinite number of the loop dimensions with smaller and smaller influence [2].

The product of two complex positive masses gives the same effects as if one mass was positive and the other negative:

$$(im_1) \cdot (im_2) = -m_1 \cdot m_2 = (-m_1) \cdot m_2 = m_1 \cdot (-m_2)$$

The third term of the right member of the equation (2) contributes a small amendment to the tensor of charge. So we have:

$$\beta\,[Q] + \sum \gamma_i\,[F_i] = \beta'[Q]'$$

We must yet explain why two masses with the same signs always attract each other regardless of the direction of the motion and two parallel conductors with the flowing currents attract or repulse each other, according to the senses of the currents of notions with the same signs. (Such currents with the same sense attract each other, and ones with the opposite senses – repulse.)
It is so because:

- Mass is the number or the matrix and current is generally the vector (it is described by the number, direction and sense)
- Mass depends on the square of the velocity (so the sense of the vector isn't important, because $v^2 = \vec{v}^2$) and the charge doesn't.

We remind that:

$$m = \frac{m_0}{\sqrt{1 - \frac{v^2}{c^2}}}$$

And next we have the de Broglie-Maxwell equation [3]

$$m = \alpha|Q|$$

And the charge doesn't depend on the velocity whereas the factor $\frac{1}{\sqrt{1-\frac{v^2}{c^2}}}$ is absorbed by the number α and therefore both members of the de Broglie-Maxwell equations present relativistic effects.

References:
[1] I. Bars, S. Yankielowicz , Physical Review D, vol. 35, no. 12, 15 June 1987
[2] Z. Morawski, "Number of Dimensions of the Universe", this website
[3] Z. Morawski, "Attempt at Unification of Interactions and Quantization of Gravitation", this website