Gravo-inertial field theory

Doriana Kiekhöven

Leibniz-Akademie und -Arbeitskreis Berlin e. V., Am Gruben 3, D-15732 Eichwalde, Germany

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Inertia is defined axiomatically. The gravitational field is caused by the flow of intergalactic masses. Origin of space and time are connected with fields. The cosmos is bounded by inertia and gravitation, which is the sequence of existence of two fields, the inertial field and the gravic field as a vortex field. Gravic and inertial field combine to a unit, the gravo-inertial field. The separation in gravic and inertial components depend on the coordinate system of motion.

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I. HISTORICAL

Well known models like "steady state theory", Einstein cosmos, Friedman cosmos are although the last expanding, "static" models, strong determined by geometry or rigid attemptions. The gravitational field is given, but no created. The deforming of space and time is necessary because given at the beginning. This may be the analog and appropriate way with a mathematical method describe a physical problem. We tried to explain background with considering the results of the mechanics of H. Hertz, V. Fock and the the epistemological considerations of G. W. Leibniz. We will outline in condensed summary our investigations about gravitation and inertia.

II. AXIOMATIC

1. Law of inertia mass
2. Conservation law
3. Special theory of relativity
4. Continuity principle
5. Creation of time and space by field and vice versa
6. Gravo-inertial field equations

The principles 1, 2 and 3 are well proved. We outline 5 and 6 considering 3. Starting point are the existence of mass and inertia. Mass is existent by space (extent) and time (motion). Motion and density change is influenced by two fields, first (\(\vec{K}\)) arised by inertia, second (\(\vec{G}\)) by gravitation, the later conditioned by motion and density change (enlargement).

III. EXPERIMENTAL

The cosmos is at present expanding with definite velocity and acceleration. The equality of gravitational and inertial mass is assumed proved. The background radiation is a characteristic of an earlier state. The present state is a result of development. Gravitation can assumed as an effect of higher order. There is a strange numeric relation between electricity and gravitation of the electron. The repulsion of two electrons is 1040 times of the attraction as the result of gravitation, the rules are similar.
IV. GRAVO-INERTIAL FIELD EQUATIONS

The gravo-inertial field equations can be written in MKS-System as

\[ \nabla \cdot \vec{K} = -\frac{\partial \rho}{\partial t} + \cdots + \text{higher orders} \quad (1) \]

\[ \nabla \cdot \vec{G} = 0 \quad (2) \]

\[ c^2 \nabla \times \vec{G} = -\frac{\partial \vec{j}}{\partial t} + \cdots + \text{higher orders} \quad (3) \]

\[ \nabla \times \vec{K} = -\frac{\partial \vec{G}}{\partial t} \quad (4) \]

where

\[ \vec{j} \quad \text{[kg/m}^2\text{s]} \text{ mass flow (in an isotropic world radial to the reference system)} \]

\[ \rho \quad \text{mass density [kg/cm}^3\text{]} \]

\[ \vec{K} \sim \vec{j} \quad \text{[kg/m}^2\text{s]} \text{ inertial field strength} \]

\[ \vec{G} \quad \text{[kg/m}^3\text{]} \text{ gravic field strength} \]

Equations (1)- (4) represents a linear partial differential equation system. The fields are created not by existence but by changing of mass density and mass flow by space and time. In this formal sense the gravo-inertial field equations have an analogy in electromagnetics (Maxwell equations).

The gravic field \( \vec{G} \) and the gravitational force \( \vec{F} \) of a test particle is proportional to its mass \( m \). If we imagine to stop the cosmos expansion, then the gravic field vanishes. Therefore there is a gravic field around the particle as result of changed density of the world by flow and there is a global attraction of all particles to each other.

\[ \vec{G}(x) = \frac{1}{c^2} \int_0^c \, d\vec{v} \times \vec{K} \quad (5) \]

From this force results the gravitational force (in analogy to Lorentz force) from the rotational field strength \( \vec{G} \), which is proportional to the mass of the particle

\[ d\vec{F} = m \cdot \tau \cdot (d\vec{v} \times \vec{G}) \quad (6) \]

with

\[ \tau \quad \text{[m}^4\text{/skg]} \text{ as an appropriate constant} \]

\( \vec{F} \) gravitational force

\( \vec{v} \) the velocity of cosmical masses summed by all masses in all directions

\( \tau \) a cosmological time dependent constant.

Because the masses are moved relatively to a particle on \( x \) it suffers a force perpendicular to the velocity \( \vec{v} \). The system is rotational-symmetric, homogeneous and isotropic.

If all masses unmoved, then \( \vec{G} = 0 \).

The inertial field \( \vec{K} \) cause a gravitational field \( \vec{G} \), on the other hand \( \vec{G} \) arises \( \vec{K} \).

We can introduce the common potentials \( \varphi \) and \( \vec{A} \).
\[ \vec{K} = -\nabla\varphi - \frac{\partial \vec{A}}{\partial t} \]

and build the wave equations

\[ \nabla^2 \varphi - \frac{1}{c^2} \frac{\partial^2 \varphi}{\partial t^2} = -\frac{\partial \varphi}{\partial t} \] (7)

\[ \nabla^2 \vec{A} - \frac{1}{c^2} \frac{\partial^2 \vec{A}}{\partial t^2} = -\frac{\partial \vec{j}}{\partial t} \] (8)

If the cosmos expands then there is the energy concentrated in the moved masses and give rise to the term on the right of equation 1. From the expanding space and time and the mass flow change by time follows the creation of a field that contradict the expansion (equation 3). Both fields are connectes by the equation 3 und 4. The analogy to Maxwell theory is obviously. In analog way we assume the separation in gravic and inertial part by four dimensional vector. We obtain a force action. The Lorentz force correspond the gravitational force \( \vec{F} \). We recognize the gravitational field as consequence of relativiy principle. In this way the gravic field on point x is a relativistic effect and local transformable. In common sense the field can only removed by stopping (transforming) of all cosmic masses in rest reference system. If the cosmos contract then the gravitation is directed away from the masses. Corresponding principle of continuity the cosmos is oscillating. The expanding masses are creating space, time and gravitation. Gravitational and inertial mass are identically, one is the cause of the other.

V. CONCLUSION

The creation of space and time are connected with fields, only the masses and the rule of inertia are given. All processes in nature are determinded by interacting fields or particles, by two energy forms or in common in twofold way. This state of cosmos is an instantaneous value which is determined by interaction. Gravitation is not determined by masses but is in a sense the result of expanding and creating space and time. In this process is created inertial field strength \( \vec{K} \) connected with a gravitational field strength \( \vec{G} \). Because the density change is cause for creation of gravitational field, the force on particles is proportional to ist masses. The drifting masses produce a "guiding field" which is with expansion or contraction radial directed.

FIG. 1. Gravo-inertial "coupled" fields
[1] H. Weyl: Raum, Zeit, Materie, Berlin, 1923
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