# Models for Quarks and Elementary Particles — Part III: What is the Nature of the Gravitational Field?

Ulrich K. W. Neumann

*Tschidererstr. 3, D-86609 Donauwörth, Germany*
E-mails: Marianne-Dru.Neumann@t-online.de; elgravi@universum-un.de

The first two parts of this article series dealt with the questions: What is a quark? and What is mass? While the present models lead to a *physical idea* of the mass, the geometrical theory of the general relativity only shows the *effect* of mass. From the physical idea of mass, from the idea of the resultant vector (EV) as electric flux $\notin$ and from the ideas relating to the magnetic monopole (MMP) it follows that the gravitational field is an electrical field. The share of the electrical gravitational flux $\notin_\Gamma$ on the entire electrical flux $\notin$ of a quark is determined from Newton's empirical gravitational constant $G$. The superposition of the $\notin_\Gamma$-fluxes of two quark collectives produces the gravitational force effect between two quark collectives. Gravitational fields reach infinitely far according to our current ideas. Connected with the quark oscillations hinted in the Parts I and II this results in the idea of the $\notin$-$\notin_\Gamma$-flux spreading with infinite speed, having enormous consequences.

## 1 Introduction

In Parts I and II separate reference is made to the most productive assumptions or ideas relating to the development of the models. In Part I the formal assumptions/ideas are shown, which include the vectors in the constellation of the outer product of a vector with certain angular movements. At the end of Part II it transpires that the locus loop created by the EV is a physical central-symmetrical sinus oscillation in the mass-affected three-quark particle. Other productive ideas are the orthogonal, hyperbolic space with two real axes and an imaginary axis as well as the identification of the formal EV with a physical meaning. The EV identified as electrical flux $\notin$ with the dimension [Vm] results in the idea of the MMP. The absolute number of $\notin$ amounts to $\notin = 1.8095\times10^{-8}$[Vm] according to the network of constants, see [1, page 143]. The massless MMP is an important idea to recognise on the one hand what mass is and on the other hand to develop the quark structure of the massless photon(-likes) from the quark composition of the electron.

## 2 The meaning of the "fountain"

In Part II the model idea for the composition of the MMP with the surrounding electrical field is shown with Fig. 1. Thus, the decisive physical components of a quark are introduced with Part II, not considering the dynamics of these components in mass-affected and massless particles. Relating to Fig. 1 it was not explained what the $\notin_\Gamma$-field is. This is done now.

During the course of the development of the models attempts were made to look behind the facade of Newton's gravitational equation wherein obviously there was no shortage of incorrect estimates, one way streets and wrong tracks. Newton's gravitational constant G included in the equation is one of the many independent quantities of the standard model of physics to be determined empirically.

In Part II it is shown what mass is. The route there commences with the equations of $E = m \times c^2$ and $E = h \times \nu$, resulting in equation 1 of Part II, which can also be described as equation (8–II) of [1]: $m = \frac{elt}{2^e\alpha \times \lambda_C \times c^2}$. If this form is introduced in Newton's gravitational equation $K_\Gamma = G \times \frac{m_a \times m_b}{l^2}$, $G$ can be determined with the correct dimension [$m^5$/VA$s^5$]:

$$G = \frac{4^e\alpha^2 \times c^4 \lambda_{Ca} \lambda_{Cb}}{elt \times n_1 \times n_2} \,. \qquad (1)$$

In it $^e\alpha$ are the fine structure constant, $\lambda_C$ the Compton wavelengths of the elementary particles involved and $elt$ see below. On the route to clarifying the gravitational equation the aim is to find what the quantities $n_1$ and $n_2$ are and how large they are. If equation (1) is solved for $n_1$ and $n_2$ and the Compton wavelengths of the nucleons (as mass-richest elementary particles) are substituted for $\lambda_C$, the empirical numerical value $\sqrt{n_1 \times n_2} = n_i = 3.939\times10^{18}$ is obtained.

The $n$ thus are gigantic numbers. What do these gigantic numbers stand for?

At this point it is highly productive to use Fig. 1 of Part II. Visible is the MMP that occurs with highest frequencies, which is enclosed by the electrical source flux $\notin$. Here, by far the predominant part of this source flux $\notin$ is closely connected with the magnetic flux $\Phi$ (Maxwell). Only the minute share $\notin_\Gamma$ of the total flux $\notin$ leads to the outside. This share is expressed in the simple relationship:

$$\notin_\Gamma = \frac{1}{n} \times \notin \,. \qquad (2)$$

If the gigantic numbers $n$ are substituted in the equation (2) (see [1, page 172, equation (8–XIII)]), it follows:

$$\not\in_\Gamma = \frac{1}{3.939\times10^{18}} \times \not\in =$$
$$= 2.539\times10^{-19} \times 1.8095\times10^{-8} = 4.594\times10^{-27}\ [\mathrm{Vm}].$$

This is the minute share of the $\not\in$-field $\not\in_\Gamma$ ($\not\in_\Gamma$-field or gravitational field), leaving the quarks of a three-quark particle (3QT). $\not\in_\Gamma$ is shown as a symbolic line in Fig. 1, Part II.

In addition to Newton's gravitational equation there are further important equations of physics with a similar structure, such as the equations of Coulomb (elec. charges), Rydberg (spectral series) and Schrödinger (waves). These equations are different forms of the universal equation from [1, page 157]:

$$elt \times elt \times n_1 \times n_2 = a \times b \times elt_a \times elt_b\,. \qquad (3)$$

In it the universal constant $elt$ has the dimension [VAsm], [1, page 141]. It can be composed of many kinds of constants, e.g.: $elt = {}^N h \times c$ [VAsm] with ${}^N h = h \times 2^e\alpha$.

Equation (3) can be paraphrased with some considerations in a further equation (4) , which can be written next to the equations of Coulomb (charges), Newton (gravitation), Rydberg (spectral series) and Schrödinger (waves): With $elt = K \times l^2$ and according to [1, Fig. 8–1c], $elt = \not\in^2 \times \varepsilon_0$ it follows from equation (3):

$$K = \frac{\varepsilon_0}{n_1 \times n_2} \times \frac{a\not\in \times b\not\in}{l^2}\,. \qquad (4)$$

If the relationship $\not\in_\Gamma = \frac{1}{n} \times \not\in$ of equation (2) is substituted in equation (4) and if some more considerations are examined, the following is obtained:

$$K = \varepsilon_0 \times \frac{a\not\in_\Gamma \times b\not\in_\Gamma}{l^2}\,, \qquad (4a)$$

$$K = \frac{\varepsilon_0}{0.8\,\pi} \times \frac{a\not\in_\Gamma \times b\not\in_\Gamma}{l^2}\,. \qquad (4b)$$

Thus the following is realised:

1. The meaning of the gigantic numbers $n_1$ and $n_2$ in Newton's empirical, gravitational constant $G$ analysed with equation (1) is seen as follows. With the product of the inverse of the number $n_i$ and of the electrical source flux $\not\in$ the minute fraction of the electrical source flux, that is to say $\not\in_\Gamma$, of each "3QT" is described, where $\not\in_\Gamma$ is leaving the quarks of a "3QT". The minute fraction of $\not\in$ accounts for the $\not\in_\Gamma$-field of a quark or a "3QT";
2. The quantity of said fraction of the $\not\in$-field of a "3QT" is $\frac{1}{3.939\times10^{18}} = 2.539\times10^{-19}$ or inverted $3.939\times10^{18}\times$ $\times\not\in_\Gamma = \not\in$. $\not\in_\Gamma$ has the empirical value $\not\in_\Gamma = 1.8095\times10^{-8}$ [Vm] $\times 2.539\times10^{-19} = 4.594\times10^{-27}$ [Vm] as absolute number. These numbers apply to our galactic environment;
3. The equations (4a) and (4b) signify that the superposition of the $\not\in_\Gamma$-fields of two quarks or two quark collectives (a and b) produces the gravitational force effect between two quark collectives;
4. These considerations have made the "gravitation" a superposition of physical namely electrical $\not\in_\Gamma$-fields of highest frequency!

## 3 Some aspects relating to the $\not\in_\Gamma$-fields

In Part II it is explained by means of Shapiro's experiments how electrical fields and thus the gravitational fields influence the photon(-likes). This physical substantiation for example for the reduction of the speed of light ("refractive index of the vacuum") is to be preferred compared to an substantiation through the geometrical theory of the general relativity.

Gravitational fields reach infinitely far according to our current ideas. The loci of the quarks (sinus oscillations) of which we and our environment consist, are traversed within $10^{-20}$ (electrons) to $10^{-25}$ (nucleons) seconds. This means the $\not\in_\Gamma$-field of a quark expands into infinity and contracts again within this absurdly short time. The propagation speed of the $\not\in_\Gamma$-field is thus infinitely large. (Of course this has an effect on large research projects as e.g. LISA with which the allegedly wave-shaped and light-speed propagation of the gravitational field according to the standard physics is to be investigated.)

The infinitely fast propagation of the $\not\in_\Gamma$-field has "natural" consequences everywhere. If the composition of the quarks according to Fig. 1 of Part II applies — which is assumed in these models — the electrical field $\not\in$ enclosing the MMPs also expands at infinite speed. This means the $\not\in$-fields of the mass-affected particles occur instantaneously. The range of the $\not\in$-fields is approximately congruent with the range within the Maginpar or the range of the $\not\in$-fields is congruent with the confinement. The confinement located inside a particle is marked off from the outer range by a spherical shell around the coordinate centre with approximately the radius of the Maginpar. ***No causality applies any longer in the small range of the $\not\in$-field within the confinement!***

The infinitely fast propagation of the $\not\in$-field undoubtedly also influences the uncertainty principle. The latter is valid for the range outside the confinement and therefore for electromagnetic processes. In the outer range with causality — with $\Delta t$ between two events — applies e.g. $\Delta t \times \Delta E = h$ or $\Delta x \times \Delta p = h$.

Inside the confinement the ranges for the toroidal magnetic field $\Phi$ and the electric source field $\not\in$ are distinguished, where $\Delta t = 0$ applies because of the instantaneous propagation of the $\not\in$-field. Some relation for the interior of the confinement corresponding to the uncertainty principle looks different; the input quantities are certain: ${}^N\Theta \times \nu \times \lambda = {}^N h$. The product from inertia quantum ${}^N\Theta$ times frequency ${}^N\Theta\times\nu$

corresponds to the impulse $p$ or $\Delta p$ and $\lambda$ corresponds to the $x$ or $\Delta x$. (Otherwise ${}^{N}\Theta = {}^{N}h/c$ is the definition equation for the natural constant ${}^{N}\Theta$.)

Entirely different aspects are touched by the infinitely fast propagation of the $\notin_{\Gamma}$-field, which are merely mentioned here but not discussed: A) The infinitely fast propagation of the $\notin_{\Gamma}$-field revitalises the Mach principle according to which the local behaviour of matter is based on the influences of the remainder of the universe. B) The universal structure of galactic chains and dark bubbles and the synchronised creation of galaxies are based on the infinitely fast propagation. C) According to the models the centres of the galaxies are quantum objects. The considerations relating to causality and uncertainty also apply to these. D) The Planck length, [1, page 178], is determined through the interaction of MMP and $\notin$-$\notin_{\Gamma}$-field. E) The experiments of A. Zeilinger for teleportation are based on the infinitely fast propagation of the $\notin$-field in the rapidly enlarging confinement of polarisation-entangled photons (12QT).

Submitted on April 05, 2008
Accepted on May 22, 2008

## References

1. There in the internet http://www.universum-un.de a book entitled “Models for quarks and elementary particles” will be displayed having a volume of approximately 250 DIN A4 pages.