# Charging the Reality-Sucks Theory*

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(comments welcome)

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**Abstract**

I extend the Reality-Sucks theory with gravitation, kinetic energy, electric charge and temperature.

## Contents



## 1 Introduction

In [1] i presented the beginning of a fully relativistic rational unit system, which can be used for historical data. For each dimension $K$ (distance, time, mass, ...) we expect a maximum measurement $c_\kappa$ called horizon. Instead of a measurement, we are using the measurement relative to the horizon.

As mentioned but not further discussed in[1], this approach may need a reformulation of physical equations. This article should fill the gap. We will see how to reformulate the equations and how to incorporate new dimensions by the examples of gravitation, kinetic energy, electrical charge, electro-magnetic waves and temperature.

The method used to determine the horizon is the same for each dimension. We define the horizons that the relative formulation yields to identical results as the usual physical law. The laws are simplified. As much physical constants as possible are moved into the horizons.

We do not expect the horizons to be constants in time. Each horizon progresses in time in relation to a progression $\phi(t)$. The actual asumption is $\phi(t) = \sqrt{(1+r_t)/(1-r_t)}$ with $r_t = t/c_t$. The direction of the time axis is reversed. Time greater than zero lies in the past.

## 2 Gravitation and Force

We start with NEWTON's law of gravitation. With $G$ the gravitation constant, $m_1$ and $m_2$ two masses and $r$ the distance between the masses, the gravitation force $F_G$ is determined by (see [2])

$$F_G = G \cdot \frac{m_1 \cdot m_2}{r^2} \tag{1}$$

For the relative formulation we have a force horizon $c_F$ and want to write

$$F_G = \frac{r_m(m_1) \cdot r_m(m_2)}{r_x(r)^2} \cdot c_F \tag{2}$$

with the relative mass $r_m(m) = m/c_m$ and the mass horizon $c_m = c_v^3 \cdot c_t/G$ mass and the relative distance $r_x(r) = r/c_x$ and the space horizon $c_x = c_v \cdot c_t$, with $c_v$ speed of light (velocity horizon) and $c_t$ the time horizon ([1]).

Both forces of equation (1) and (2) must be identical and we can determine the force horizon $c_F$

$$
\begin{aligned}
G \cdot \frac{m_1 \cdot m_2}{r^2} &= \frac{\frac{m_1}{c_m} \cdot \frac{m_1}{c_m}}{\frac{r^2}{c_x^2}} \cdot c_F \\
&= \frac{m_1 \cdot m_2}{r^2} \cdot \frac{c_x^2}{c_m^2} \cdot c_F && (3) \\
G &= \frac{c_x^2}{c_m^2} \cdot c_F && (4) \\
c_F &= \frac{G \cdot c_m^2}{c_x^2} \\
&= \frac{G \cdot \frac{c_v^6 c_t^2}{G^2}}{c_v^2 c_t^2} \\
&= \frac{c_v^4}{G} && (5)
\end{aligned}
$$

The progression in time is obviously $V(t)^4$, with $V(t) = \phi(t)$ the progression in time of velocities.

We can use the redefinition of the gravitation law to test the consistency of the Reality-Sucks theory. The potential energy $E_{pot}$ of the gravitation between the two masses can be calculated by

$$
\begin{aligned}
E_{pot} &= \int F_G \, dx \\
&= \int G \cdot \frac{m_1 \cdot m_2}{r^2} \, dx \\
&= -G \cdot \frac{m_1 \cdot m_2}{r} && (6)
\end{aligned}
$$

with equation (1) as force or relative by

$$
\begin{aligned}
E_{pot} &= \int r_F(F_G) \, dr_x \cdot c_E \\
&= \int \frac{r_m(m_1) \cdot r_m(m_2)}{r_x(r)^2} \, dr_x \cdot c_E \\
&= -\frac{r_m(m_1) \cdot r_m(m_2)}{r_x(r)} \cdot c_E && (7)
\end{aligned}
$$

with $r_F(F_G) = F_G/c_F$ as relative force. Both must be identical and we can use it to determine the energy horizon $c_E$. In [1] we have determied it with the uncertainty principle and mass-energy equivalence. The determination with the gravitation potential should yield the same.

Setting equations (6) and (7) into relation we get with $c_x = c_v c_t$ and $c_m = c_v^3 c_t/G$ ([1])

$$
\begin{aligned}
-G \cdot \frac{m_1 \cdot m_2}{r} &= -\frac{r_m(m_1) \cdot r_m(m_2)}{r_x(r)} \cdot c_E \\
G \cdot \frac{m_1 \cdot m_2}{r} &= \frac{\frac{m_1}{c_m} \cdot \frac{m_2}{c_m}}{\frac{r}{c_x}} \cdot c_E \\
G &= \frac{c_x}{c_m^2} \cdot c_E \\
G &= \frac{c_v \cdot c_t}{\frac{c_v^6 \cdot c_t^2}{G^2}} \cdot c_E \\
G &= \frac{G^2}{c_v^5 \cdot c_t} \cdot c_E \\
c_E &= \frac{c_v^5 \cdot c_t}{G} && (8)
\end{aligned}
$$

which is identical to the result determined with the uncertainty principle. So far, we get consistent results.

# 3 Kinetic Force and Energy

NEWTON's second law of motion defines the force $F_{kin}$ as ([3])

$$F_{kin} = m \cdot a \tag{9}$$

with $m$ the mass and $a$ the acceleration. In the Reality-Sucks theory we want to write

$$r_F(F_{kin}) = r_m(m) \cdot r_a(a) \tag{10}$$

with $r_F(F_{kin}) = F_{kin}/c_F$, $r_m(m) = m/c_m$ and $r_a(a) = a/c_a$ the relative values. The acceleration horizon $c_a$ is the unknown parameter.

We have

$$\begin{aligned}\frac{F_{kin}}{c_F} =& \frac{m}{c_m} \cdot \frac{a}{c_a}\\ =& m \cdot a \cdot \frac{1}{c_m \cdot c_a}\\ =& F \cdot \frac{1}{c_m \cdot c_a}\end{aligned} \tag{11}$$

from which we get with $c_m = c_v^3 \cdot c_t / G$ ([1]) and equation (5)

$$\begin{aligned}c_a =& c_m \cdot c_F\\ =& \frac{c_v^3 \cdot c_t}{G} \cdot \frac{c_v^4}{G}\\ =& \frac{c_v^7 \cdot c_t}{G^2}\end{aligned} \tag{12}$$

The progression of the acceleration in time $A(t)$ we get with the progression of the velocities $V(t) = \phi(t)$ and of time $T(t) = \sqrt{1/\phi(t)^5}$ ([1]) as

$$\begin{aligned}A(t) =& V(t)^7 \cdot T(t)\\ =& \phi(t)^7 \cdot \sqrt{\frac{1}{\phi(t)^5}}\\ =& \sqrt{\frac{\phi(t)^{14}}{\phi(t)^5}}\\ =& \sqrt{\phi(t)^9}\end{aligned} \tag{13}$$

The gravitation constant is a constant in time ([1]).

To test for the consistency of our definitions (see section 2), we define the relative kinetic energy $r_{E_{kin}}$ as

$$\begin{aligned}r_E(E_{kin}) =& \int r_F(F_{kin})\, dr_x\\ =& \frac{1}{2} \cdot r_m(m) \cdot r_v(v)^2\end{aligned} \tag{14}$$

with $r_v(v)$ the relative of the velocity $v$ of the object. We have with $c_E = c_m \cdot c_v^2$ ([1])

$$\begin{aligned}\frac{E_{kin}}{c_E} =& \frac{1}{2} \cdot \frac{m}{c_m} \cdot \frac{v^2}{c_v^2}\\ =& \frac{1}{2} \cdot m \cdot v^2 \cdot \frac{1}{c_m \cdot c_v^2}\\ =& \frac{1}{2} \cdot m \cdot v^2 \cdot \frac{1}{c_E}\end{aligned} \tag{15}$$

which yields to the usual kinetic energy, as it should

$$E_{kin} = \frac{1}{2} \cdot m \cdot v^2 \tag{16}$$

## 4 COULOMB Force

To use electric charge in the Reality-Sucks theory, we need the charge horizon $c_Q$, which is the maximal eletric charge. We will determine it with COULOMB's law

$$F_Q = k_e \cdot \frac{q_1 \cdot q_2}{r^2} \tag{17}$$

for the force $F_Q$ between two charges $q_1$ and $q_2$, with $r$ the distance between the two charges and $k_e = 1/(4\pi \cdot \epsilon_0)$ the COULOMB constant, which is related to the vacuum permitivity $\epsilon_0$ ([5], [6]).

In Reality-Sucks we want to redefine COULOMB's law as

$$F_Q = \frac{r_Q(q_1) \cdot r_Q(q_2)}{r_x(r^2)} \cdot c_F \tag{18}$$

with the relative charge $r_Q(q) = q/c_Q$ and the relative distance $r_x(x) = x/c_x$. The force horizon $c_F$ is known. The charge horizon $c_Q$ can be determined.

The forces of the equations (17) and (18) should be identical and we get with $c_x = c_v \cdot c_t$ and equation (5)

$$k_e \cdot \frac{q_1 \cdot q_2}{r^2} = \frac{q_1 \cdot q_2}{r^2} \cdot \frac{c_x^2}{c_Q^2} \cdot c_F \tag{19}$$

$$\begin{aligned} c_Q^2 &= \frac{c_x^2 \cdot c_F}{k_e} \\ &= \frac{c_v^6 \cdot c_t^2}{k_e \cdot G} \end{aligned} \tag{20}$$

$$c_Q = \frac{c_v^3 \cdot c_t}{\sqrt{k_e \cdot G}} \tag{21}$$

The progression in time is $Q(t) = V(t)^3 \cdot T(t) = \sqrt{\phi(t)}$ and identical to the progression of masses (see [1]).

In the Reality-Sucks theory we have the law of relative identity ([1]). For each relative minimum of a dimension there exist a relation with the relative minimal time $h_t/c_t$. For charges we expect the relation

$$\sqrt{\alpha_Q} \cdot \frac{h_Q}{c_Q} = \frac{h_t}{c_t} \tag{22}$$

Here $\alpha_Q$ is the parameter to be determined, $h_Q$ is the minimal charge, which is the elementary charge $e$, $h_t = \sqrt{h \cdot G/c_v^5}$ is the minimal time with $h$ the PLANCK constant and $c_t$ is the time horizon. We get

$$\begin{aligned} \sqrt{\alpha_Q} \cdot \frac{h_Q}{\frac{c_v^3 \cdot c_t}{\sqrt{k_e \cdot G}}} &= \frac{\sqrt{\frac{h \cdot G}{c_v^5}}}{c_t} \\ \sqrt{\alpha_Q} \cdot \frac{h_Q \cdot \sqrt{k_e \cdot G}}{c_v^3} &= \sqrt{\frac{h \cdot G}{c_v^5}} \\ \alpha_Q \cdot \frac{h_Q^2 \cdot k_e \cdot G}{c_v^6} &= \frac{h \cdot G}{c_v^5} \\ \alpha_Q \cdot \frac{h_Q^2 \cdot k_e}{c_v} &= h \end{aligned}$$

$$\alpha_Q = \frac{h \cdot c_v}{h_Q^2 \cdot k_e} \tag{23}$$

$$\alpha_Q = \frac{2\pi}{\alpha_0} \tag{24}$$

with $\alpha_0 = e^2/(2\epsilon_0 c_v h)$ the fine-structure constant ([7]).

As with the gravitation force in section 2, we can use the COULOMB energy to test the consistency of the definition of the energy horizon $c_E$. The potential energy $E_{pot}$ of the two charges can be calculated by

$$\begin{aligned} E_{pot} &= \int F_Q \, dx \\ &= \int k_e \cdot \frac{q_1 \cdot q_2}{r^2} \, dx \\ &= -k_e \cdot \frac{q_1 \cdot q_2}{r} \end{aligned} \tag{25}$$

with equation (17) as force or relative by

$$
\begin{aligned}
E_{pot} &= \int r_F(F_Q)\, dr_x \cdot c_E \\
&= \int \frac{r_Q(q_1) \cdot r_Q(q_2)}{r_x(r)^2}\, dr_x \cdot c_E \\
&= -\frac{r_Q(q_1) \cdot r_Q(q_2)}{r_x(r)} \cdot c_E
\end{aligned} \tag{26}
$$

with equation (18) as force. Both must be identical and we get

$$
\begin{aligned}
-k_e \cdot \frac{q_1 \cdot q_2}{r} &= -\frac{r_Q(q_1) \cdot r_Q(q_2)}{r_x(r)} \cdot c_E \\
k_e &= \frac{c_x}{c_Q^2} \cdot c_E \\
&= \frac{c_v \cdot c_t}{\frac{c_v^6 \cdot c_t^2}{k_e \cdot G}} \cdot c_E \\
&= \frac{k_e \cdot G}{c_v^5 \cdot c_t} \cdot c_E \\
c_E &= \frac{c_v^5 \cdot c_t}{G}
\end{aligned} \tag{27}
$$

which is the identical result as in equation (8) and [1]. The definitions are consistent.

## 5 Electro-Magnetic Waves

So far, we have encounted equations, where we had to remove a parameter (if at all). With the energy of a photon, we have to change the parameter in the relativ representation. The energy of a photon $E$ is proportional to it's frequency $f$ with the PLANCK constant $h$ as proportional factor ([8])

$$E = h \cdot f \tag{28}$$

In the Reality-Sucks theory we want to rewrite it as

$$E = r_h \cdot \tau \cdot r_f(f) \cdot c_E \tag{29}$$

with the maximum energy $c_E = c_v^5 \cdot c_t / G$ (equation (8)), the relative PLANCK constant $r_h = h/(c_E \cdot c_t) = h_t^2 / c_t^2$, whre $h_t$ is the minimum time, $\tau$ some factor, we will remove later and the relative frequency $r_f(f) = f / c_f$ with the maximum frequency $c_f = 1/h_t$ ([1]). We are looking for $\tau$ and get

$$
\begin{aligned}
h \cdot f &= \frac{h}{c_E \cdot c_t} \cdot \tau \cdot \frac{f}{c_F} \cdot c_E \\
1 &= \frac{1}{c_t} \cdot \tau \cdot h_t \\
\tau &= \frac{c_t}{h_t}
\end{aligned} \tag{30}
$$

This result we reset into equation (29)

$$
\begin{aligned}
r_E(E) &= r_h \cdot \frac{c_t}{h_t} \cdot r_f(f) \\
&= \frac{h_t^2}{c_t^2} \cdot \frac{c_t}{h_t} \cdot r_f(f) \\
&= \frac{h_t}{c_t} \cdot r_f(f)
\end{aligned} \tag{31}
$$

The PLANCK constant is replaced by a relative minimum time.

## 6 Temperature

To include temperature into the Reality-Sucks theory, we use the ideal gas law ([9])

$$p \cdot V = N \cdot k_B \cdot T \tag{32}$$

with the pressure $p = F/A$ the force $F$ per area $A$, the volume $V$, the number of particles $N$, the BOLTZMANN constant $k_B$ and the absolute temperature $T$. The relative equation should be

$$\begin{aligned} r_p(p) \cdot r_V(V) &= N \cdot r_T(T) \\ \frac{p}{c_p} \cdot \frac{V}{c_V} &= N \cdot \frac{T}{c_T} \\ p \cdot V &= N \cdot \frac{T}{c_T} \cdot c_p \cdot c_V \\ &= N \cdot \frac{T}{c_T} \cdot \frac{c_F}{c_A} \cdot c_V \\ &= N \cdot \frac{T}{c_T} \cdot \frac{c_F}{c_x^2} \cdot c_x^3 \\ &= N \cdot T \cdot \frac{c_F \cdot c_x}{c_T} \end{aligned} \tag{33}$$

with the area horizon $c_A = c_x^2$, the volume horizon $c_V = c_x^3$ and the temperature horizon $c_T$. Both equations must be equal. We get with equations (5), (8) and $c_x = c_v \cdot c_t$ ([1]) for the temperature horizon

$$\begin{aligned} N \cdot k_B \cdot T &= N \cdot T \cdot \frac{c_F \cdot c_x}{c_T} \\ k_B &= \frac{c_F \cdot c_x}{c_T} \\ c_T &= \frac{c_F \cdot c_x}{k_B} & (34) \\ &= \frac{c_v^5 \cdot c_t}{G \cdot k_B} & (35) \\ &= \frac{c_E}{k_B} & (36) \end{aligned}$$

Obviously, temperature progresses as energy, i. e., the progress in time is $T(t) = \sqrt{\phi(t)^5}$.

# 7 Conclusion

It is considerable easy to incorporate new dimensions into the Reality-Sucks theory. All that is needed is an equation, in which the dimension is used, preferable a fundamental relation to already known dimensions. Numbers without a dimension stay the same. Parameter, which consist of a number multiplied with a unit, become the number multiplied with the relative unit. The relations, in which the parameter is used, may need to be reformulated.

# References


[1] SVEN GOHLKE: *About the Description of Nature*, `https://vixra.org/abs/2211.0084` (retrieved 2022-12-29).

[2] Wikipedia article on NEWTON's law of universal gravitation (retrieved 2022-12-29).

[3] Wikipedia article on NEWTON's laws of motion, section "Second" (retrieved 2022-12-29).

[4] Wikipedia article on the elementary charge (retrieved 2022-12-29).

[5] Wikipedia article on COULOMB's law (retrieved 2022-12-29).

[6] Wikipedia article on vacuum permittivity (retrieved 2022-12-29).

[7] Wikipedia article on the fine-structure constant (retrieved 2022-12-29).

[8] Wikipedia article on the PLANCK relation (retrieved 2022-12-29).

[9] Wikipedia entry on the ideal gas, section "Common forms" (retrieved 2022-12-29).