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A heuristic density model to explain the gap between physical and extraphysical dimensions

Massimiliano Sassoli de Bianchi

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Abstract

A simple density model is presented to explain the energetic separation between the physical and extraphysical dimensions and the possible role of the energosoma as a mediator structure of variable density, able to increase the efficiency of an interdimensional energy transfer. The model, which is only heuristic, is discussed both from the viewpoint of classical and quantum physics.

1 Introduction

Our multidimensional reality is made of different energetic substances. Physical substances, called *matter*, form our physical (material) dimension, which has been thoroughly investigated by *physicists*, particularly in the last two centuries. Extraphysical substances, that we may also call *paramatter*, are instead assumed to make up our much vaster extraphysical dimensions and are the domain of investigation of the *paraphysicist*, an emerging scientific figure that we can expect to gain more recognition in the future. However, contrary to physics, paraphysics has not yet reached on this planet the level of development of a quantitative, fully mathematized hard science, and intraphysical (incarnated) paraphysicists are in the same situation today as were Greek philosophers like Democritus (about 460-370 B.C.) when speculating about the atomic or non-atomic nature of physical matter.[1]

A strategy paraphysicists can certainly adopt for the time being, to study the properties of paramatter and its interactions with ordinary matter, is to exploit all possible analogies with what is already established regarding our physical dimension. Indeed, it is to be expected that some of the general principles and models that have so far been developed in physics will also prove their usefulness, *mutatis mutandis*, in the understanding of our extraphysical reality, at least in the initial stages of development of paraphysics. Of course, this exercise has to be carried out *cum grano salis*, otherwise, as emphasized for instance by Vernon Vugman (1999), migration of concepts from physics to paraphysics may result in some form of reductionism and possibly delay the development of the latter.

The purpose of the present article is to discuss some simple heuristic models in order to gain a better understanding of the possible interaction mechanisms between the substances forming different existential dimensions. More precisely, we will consider the following two specific dimensions: the *physical* and the so-called

[1] In fact, Greek philosophers like Democritus were not only interested in explaining physical substances, but extraphysical ones as well.

extraphysical per se (Vieira, 2002). As it is well known, these two dimensions appear to interact very weakly, seeing that it is not at all easy for an extraphysical consciousness to objectively directly manifest in the physical dimension (the converse being equally true, of course). A natural question then arises:

Why can't an extraphysical substance easily interact with a physical substance, and vice versa?

The question, at first sight, may appear puzzling, because the physical and extraphysical dimensions both contain, at least in principle, unlimited amounts of energy. Therefore, the observed weak interactivity cannot be explained by a mere argument of energy-shortage of one dimension compared to the other, not to mention that the problem manifests in both directions: from the extraphysical to the physical but from the physical to the extraphysical as well. Thus, a more refined version of the above question could be:

Why is the energy transfer from the extraphysical to the intraphysical dimension, and vice versa, in general, so inefficient?

2 The frequency model

To answer the above question, one usually invokes the concept of *frequency*. Let us briefly describe how the typical heuristic goes. One starts by assuming that all entities within reality possess vibrational properties,[2] expressible in terms of a set of characteristics, natural resonance *frequencies*, forming the frequency *spectrum* of the entity. To be more specific, let us denote by σ_A the spectrum of a given entity A. This means that A can *vibrate* only at frequencies belonging to the set σ_A. In the same way, consider another entity B, possessing a spectrum σ_B. Now, since A and B can only vibrate at frequencies within their own spectrum, they can interact together, i.e., they can efficiently exchange energy, if and only if the intersection $\sigma_A \cap \sigma_B$ of their spectra is not the empty set (see Figure 1).

Then, one can explain the inefficiency of the energy transfer

[2] This hypothesis is also known as the *principle of vibration*, in hermetic philosophy.

between the physical and the extraphysical dimensions by hypothesizing that the vibrational frequencies characteristic of an extraphysical entity are, generally speaking, much higher than those of a physical one, so that their spectra do not overlap. In other words, physical and extraphysical entities cannot efficiently exchange energy as they do not share a common frequency channel through which they could communicate (see Figure 2).

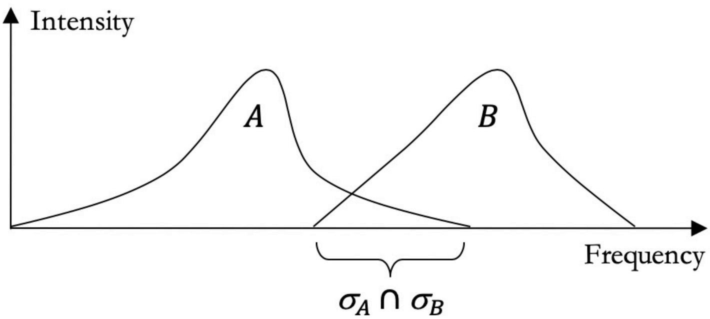

Figure 1 A schematic illustration of two entities whose spectra overlap (i.e., their intersection is not empty).

The hypothesis that entities belonging to the extraphysical dimensions do vibrate at higher frequencies in comparison to physical entities is supported by a certain number of paraperceptions, as reported for instance by lucid (out of body) projectors. Let us mention, as a typical example, the sensation of an intense, increasing and continuous vibration (vibrational state) which can be experienced during the period of exteriorization of the psychosoma.

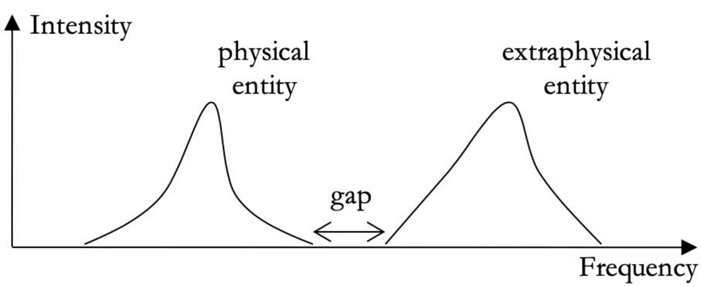

Figure 2 A schematic illustration of a physical and an extraphysical entities, whose spectra do not overlap.

But although it is undeniable that the physical and extraphysical dimensions cannot easily affect one another, it is also incontestable that there exist multidimensional structures for which the interdimensional energy transfer seems to work with great efficiency. Consider for instance our soma, whose existence heavily depends on being sustained by the psychosoma. Despite the hypothesized frequency gap between these two vehicles, an intense flux of informed energy appears to be efficiently and continuously maintained between them, during the entire intraphysical life of the consciousness.

Why does the energy transfer between the psychosoma and the soma, and vice versa, arise with great efficiency within our holosomatic structure?

The well-known answer to the above question is to point out that between the psychosoma and the soma there is an intermediary energizing agent, the *holochakra* (also called the *energosoma*), and that it is precisely thanks to its role of *mediator* that the two vehicles can efficiently exchange energy. Within the paradigm of the frequency model, one can explain the functioning of the holochakra by simply assuming that the quasiphysical (or quasiextraphysical) substances it is made of possess a frequency spectrum which is intermediary with respect to the somatic and psychosomatic ones, so that it has a non-empty intersection with both of them. In other words, the holochakra would act as a bridge between the somatic and psychosomatic vehicles, by filling in the frequency gap between these two entities (see Figure 3).

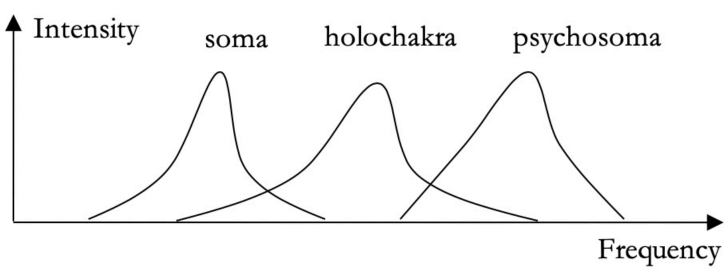

Figure 3 The holochakra playing the role of a frequency-bridge between the soma and the psychosoma.

3 The classical density model

The frequency (resonance) model that we have briefly described is well known and has been widely discussed in the literature. Almost all works investigating "subtle" energies do mention, in a way or another, the idea of frequencies and resonances. Just to give an example, see Vieira (2002), p. 205 and pp. 979-987. Of course, determining which type of fields these frequencies would refer to is an issue that the frequency heuristic model does not address. Obviously, these are not frequencies related to known physical fields, such as the electromagnetic one. On the other hand, a heuristic model is not meant to necessarily offer a tested solution to a problem, but to provide a way of thinking that can facilitate the access to more advanced knowledge, in the ambit of more elaborated and mature scientific theories.

The purpose of the present work is to present a heuristic model which constitutes an alternative to the frequency model, providing a conceptual framework that can also explain the observed inefficiency of the interdimensional energy transfer. The model is extremely simple: it consists in saying that the most important difference between matter and paramatter resides in their different *densities*. More precisely, our basic assumption is that, generally speaking, *matter is much denser than paramatter*. However, we do not mean by this that extraphysical substances would be more *rarefied* than physical ones, as it would be the case, for instance, for a gas in comparison to a liquid or to a solid. What we intend is that a typical physical particle (like an electron) is, by many orders of magnitude, much more massive than a typical extraphysical particle (for instance, a paraelectron, assuming it would exist). Therefore, given a physical and an extraphysical substance, each having the same number of particles per unit volume, what we are here assuming is that the density of the former is much higher than the density of the latter, because the *inertial masses* of physical particles are, in general, much higher than those of extraphysical ones.

As for the frequency hypothesis, the density hypothesis is supported by a number of paraperceptions, as reported by lucid projectors (Vieira, 2002). Let us mention, as a typical example, the phenomenon of *extraphysical bradykinesis*, a condition of slowness perceived by the consciousness while moving in the projected psychosoma. The cause of this slow-motion effect is usually perceived as being related to a higher density of the *extraphysical sphere of energy*, in comparison to the lightness of the substance forming the moving psychosoma.

Let us now assume, to simplify our model as much as possible, that both the material and paramaterial substances are made of *classical point-like particles*. According to our hypothesis, the only relevant difference between the two substances resides in the mass of their constituents. More precisely, let us denote by m the typical mass of a *paramaterial* particle and by M the typical mass of a *material* one. Our hypothesis is that the mass ratio m/M is very close to zero.

To determine the efficiency of the energy transfer between paramatter and matter, we need to analyze what happens during a *collision* between a paramaterial particle and a material one, and ask:

How much energy can the paraphysical particle of mass m *transfer to the physical particle of mass* M*?*

To answer this question, let v be the velocity of the paraphysical particle moving toward the physical one, and let us assume that the latter is initially at rest (see Figure 4).

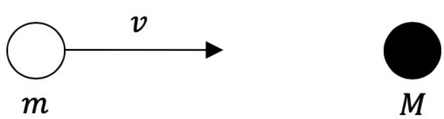

Figure 4 An extraphysical particle impinging with velocity v on a physical particle, initially at rest.

After the collision (here assumed one-dimensional and purely elastic, for simplicity), the paraphysical particle will move in the opposite direction with a smaller velocity $v' < v$, whereas the physical particle, which was initially at rest, will acquire a non-zero velocity v'' (see Figure 5).

Figure 5 Following the collision, the lighter extraphysical particle bounces back, after having put the physical particle into movement.

The initial energy E of the incoming paraphysical particle is given by its kinetic contribution $E = \frac{1}{2}mv^2$. Similarly, the final energy E'' acquired by the physical particle is given by $E'' = \frac{1}{2}mv''^2$. We are interested in calculating the *energy efficiency* η of the collision process. More precisely, we want to determine the ratio $\eta = E''/E$, given by the *output energy* E'' of the physical particle divided by the *input energy* E of the paraphysical one. By definition, the dimensionless parameter η is a number between 0 and 1. The case $\eta = 0$ corresponds to a zero-energy transfer, whereas the case $\eta = 1$ corresponds to a total energy transfer.

To calculate η, one needs to exploit two important principles: *energy conservation* and *momentum conservation*. After some algebra, one easily finds for η the following simple formula:

$$\eta = \frac{4\lambda}{(1+\lambda)^2}$$

where we have defined $\lambda = m/M$. We can observe that the efficiency only depends on the mass ratio λ, and that its maximum value $\eta = 1$ is reached when $\lambda = 1$, that is, when the collision is between two particles of same mass (think for instance to the well-known *Newton's pendulum*).

In the situation of our concern, however, which is the interaction between paramatter and matter, the mass ratio λ is typically close to zero, as by hypothesis M exceeds m by many orders of magnitude. Now, if λ tends to zero, it immediately follows from the above formula that the efficiency η of the energy transfer also tends to zero.

As an example, let us hypothesize that the mass of a typical paraphysical particle is, on average, *one thousandth* of the mass of a physical one, based on the speculation that the average weight of a projected intraphysical consciousness' psychosoma appears to be, approximately, one thousandth of the weight of the human body that houses it [see (Vieira, 2002), page 288]. Then, replacing $\lambda = 0.001$ into the previous formula, one obtains for the efficiency, the approximate value: $\eta \cong 0.004 = 1/250$. This means that to transfer 1 unit of energy to a physical particle, an extraphysical particle would need to carry at least 250 units of energy, that is, 250 times more.

Thanks to this elementary model of classical colliding particles, we can already understand why the energy transfer between paramatter and matter is so difficult. Due to the hypothesized great mass difference between the physical and extraphysical energetic carriers, the efficiency of the process is very low, and one needs huge amounts of energy to produce even the tiniest effect.[3] So, as we did for the frequency model, we can now ask the following question:

Can we use our simple model of point-like classical particles to gain some insight into the functioning of the holochakra, i.e., in its role of energetic mediator between the soma and the psychosoma?

To this end, let us assume that the energetic substance composing the holochakra is made of quasiphysical particles having an intermediary mass compared to those composing the soma and psychosoma. As we shall see, this assumption is sufficient to explain the observed gain in efficiency for the energy transfer due to the mediation of the holochakra. More precisely, let us suppose that the energy transfer from the incident paraphysical particle of mass m to the target physical particle of mass M takes place with the help of another particle of mass μ, located between them (see Figure 6). In other terms, the incident paraphysical particle of energy E first hits the mediator particle (supposed at rest), which next hits the final physical target particle (also supposed at rest).

[3] It is worth emphasizing that the obtained formula for the energy efficiency η also remains valid if the incoming particle of energy E is the physical instead of the paraphysical one, so that exactly the same inefficiency in the energy transfer holds when going from the physical to the extraphysical, as one would expect. One can in particular observe that

$$\eta = \frac{4\lambda}{(1+\lambda)^2} = \frac{4\lambda^{-1}}{(1+\lambda^{-1})^2}$$

which means that the roles of m and M are interchangeable in the formula.

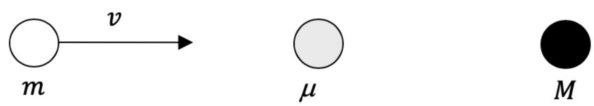

Figure 6 A quasiphysical particle is placed between the incoming extraphysical particle and the target physical particle.

The efficiency η_2 of the entire process is now given by the product of the efficiencies of the two successive collisions. Thus:

$$\eta_2 = \frac{4\alpha}{(1+\alpha)^2}\frac{4\beta}{(1+\beta)^2}$$

where $\alpha = m/\mu$ and $\beta = \mu/M$. If the three masses are equal, then $\alpha = \beta = 1$ and $\eta_2 = 1$, i.e., the energy transfer is maximum. But in the situation of our interest, all three masses are different, and the energy transfer is not equal to unity. However, we may ask for which value of the mediator mass μ the efficiency η_2 reaches its maximum value. After a straightforward calculation, one finds that the maximum is reached when the mediator mass μ is exactly the *geometric mean* of the masses m and M, i.e., $\mu = \sqrt{mM}$. Then, we have $\alpha = \beta = \sqrt{\lambda}$, and replacing these values into the previous formula, one finds for the efficiency:

$$\eta_2 = \frac{16\lambda}{(1+\sqrt{\lambda})^4}$$

We can compare this expression with the one previously derived for the efficiency η in the absence of the mediator particle. As before, let us consider the case where the mass m of the paraphysical particle is one thousandth of the mass M of the physical one. Replacing the value $\lambda = 0.001$ into the above expression, one finds for the efficiency: $\eta_2 \cong 0.014 \cong 1/71$. Thus, we obtain that to transfer 1 unit of energy to a physical particle, an extraphysical particle using a single optimal mediator only needs to carry 71 units of energy, instead of 250. In other terms, thanks to the mediator, the efficiency of the energy transfer has been increased by 350%. And in fact, it can be shown that it can be increased up to 400%; see (Bashkansky et al, 2007).

The above simple calculation shows that by using a mediator particle with a suitable intermediary mass, one can considerably increase the efficiency of the energy transfer. But then, we may further ask:

Can we further increase the efficiency of the process by increasing the number of mediators?

To answer this question, let us assume that between the incoming paraphysical particle of mass m and the final target particle of mass M, there is an entire linear arrangement of $n-1$ quasiphysical intermediary particles of variable mass (see Figure 7).

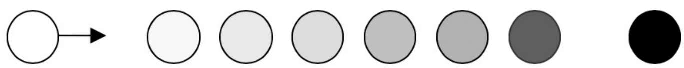

Figure 7 Quasiphysical particles of increasing mass are placed between the incoming extraphysical particle and the target physical particle.

We can choose the masses of the intermediary particles in the following way. Let $\mu(x)$ be a well-behaved function, defined in the closed interval $[0,1]$, such that $\mu(0)=m$ and $\mu(1)=M$. Without losing generality, we can define the masses of the $n+1$ particles (the incoming paraphysical particle plus the $n-1$ quasiphysical mediator particles plus the target physical particle) as follows:

$$m_k = \mu\left(\frac{k}{n}\right), k = 0,1,2,\dots,n$$

To calculate the energy efficiency η_n of the multiple process, we need to observe that it is simply given by the product of the efficiencies of the n sequential collisions:

$$\eta_n = \eta_{0,1}\,\eta_{1,2} \cdots \eta_{n-1,n}$$

where $\eta_{k,k+1}$ is the ratio of the energy transferred to the particle of mass m_{k+1} to the energy of the incoming particle of mass m_k, which is given by:

$$\eta_{k,k+1} = \frac{4\alpha_{k,k+1}}{(1+\alpha_{k,k+1})^2}$$

with $\alpha_{k,k+1} = m_{k+1}/m_k$. It is then an easy matter to show that, as the number n of mediators tends to infinity (i.e., as $n \to \infty$), the efficiency η_n tends to 1 (i.e., it becomes maximal), provided $\mu(x)$ is a differentiable function (Sassoli de Bianchi, 2007).

To perform an explicit calculation, let us choose the special case where $\mu(x) = \lambda^{-x}m$. It is then straightforward to obtain the following formula for the efficiency:

$$\eta_n = \left(\frac{2\sqrt{\lambda^{\frac{1}{n}}}}{1 + \lambda^{\frac{1}{n}}} \right)^{2n}$$

For the values $n = 1$ and $n = 2$, we recover the two previously derived expressions for η and η_2, respectively. But, as the number of intermediary quasiphysical particles increases, i.e., as n tends to infinity, then $\lambda^{\frac{1}{n}}$ tends to $\lambda^0 = 1$ and η_n also tends to 1, in accordance with the previously mentioned general result.

Consider once more the case $\lambda = 0.001$. Then, one can use the above expression to calculate the following values for η_n:

$\eta_1 \cong 0.004$, $\eta_2 \cong 0.014$, $\eta_5 \cong 0.109$, $\eta_{10} \cong 0.310$,
$\eta_{50} \cong 0.788$, $\eta_{100} \cong 0.888$, $\eta_{200} \cong 0.942$, $\eta_{400} \cong 0.971$

Thus, for an array of approximately 100 mediators, one finds that the efficiency of the energy transfer is already very close to its maximum value.

Let us briefly summarize our findings so far. The hypothesis at the basis of our simple model is that substances pertaining to different dimensions exhibit different densities, hence different inertial masses of its constituents, a physical particle being, on average, much more massive than an extraphysical one. This hypothesis, together with the energy and momentum conservation laws (which are here assumed to apply also in the extraphysical dimensions), can explain the observed weak interactivity among matter and paramatter. According to this model, the holochakra could be understood as an interdimensional bridge made of multidimensional substances of variable density.

As we said already, the density gradient of the holochakra should however not be understood as the result of a rarefaction of its constituents, but instead as a variation of their intrinsic inertial properties. To assure a maximum efficiency in the downloading and uploading of energies, it is sufficient for the mass of the particles composing the holochakra (also called *silver cord*) to vary smoothly, when going from the physical to the extraphysical, and vice versa (see Figure 8).

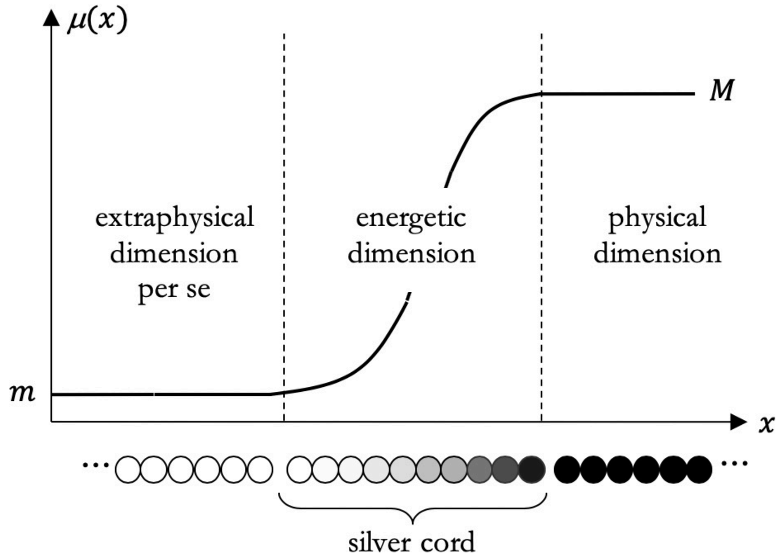

Figure 8 The holochakra (silver cord) as a variable density/mass structure bridging the physical and extraphysical dimensions.

5 The quantum mass model

The mass model we have presented is very simple and its interest resides mainly in its heuristic content. But apart from the oversimplification of having considered one-dimensional, non-quantum, non-relativistic particles, it is also legitimate to ask on which basis one can assume that the inertial mass of a particle globally decreases when going from a lower to a higher existential dimension. In other terms:

What kind of picture can we adopt to justify the hypothesized dimensional-dependence of a particle's inertial mass?

An interesting answer comes from the study of non-homogeneous crystals and semiconductor heterostructures. Indeed, in the study of the transport properties of quantum particles (like for instance electrons) propagating in such systems, one can usually take into account the interaction of the particle with its host structure in terms of an *effective mass*. In other words, according to this approximation, everything happens as if the particle moving inside the structure acquires a different effective inertial mass. Accordingly, it also follows that when the media inside which a quantum particle moves is non-homogeneous, then its effective mass is no more a constant of the motion, but a function of its position [see for instance Lévy-Leblond (1995) and the references cited therein].

Adopting such a conceptual framework, one can hypothesize by analogy that the overall structure characterizing an entire reality dimension (like for instance the physical or the extraphysical *per se*) is similar to a huge ordered crystalline structure inside which the different energetic entities can manifest and move. This would mean that entities can experience different effective masses according to the specific, crystal-like, dimensional structure in which they are immersed, and this could support our hypothesis of a variation of particles' inertial properties when traveling in different existential dimensions.

The above discussion allows us to propose an additional quantum model, suggesting an extra mechanism for the observed inefficiency of the interdimensional energy transfer. Instead of considering classical colliding particles, we can now consider the propagation of a flux of independent quantum particles with *position-dependent mass*. When inside the extraphysical domain, the particles possess an effective mass m, but when inside the physical domain, as the structure is different, they acquire a greater effective mass M.

In quantum mechanics, the equation describing the motion of a (here one-dimensional) "free" particle of energy E with position-dependent mass $\mu(x)$, is given by a modified version of the stationary Schrödinger equation (Lévy-Leblond, 1995):

$$-\frac{1}{2}\partial_x\left[\frac{1}{\mu(x)}\right]\partial_x\psi_E(x) = E\psi_E(x)$$

where $\psi_E(x)$ denotes the particle's wave function. Let us consider the situation where an extraphysical particle tries to penetrate into the physical dimension, without passing through a mediator structure like the holochakra. In this case, the particle experiences an abrupt variation of its effective mass as a consequence of the sharp (discontinuous) interdimensional interface. This means that the effective position-dependent mass $\mu(x)$ of the particle is described by a step-like function (see Figure 9).

As before, we are interested in determining the efficiency η of the energetic transfer, which is now given by the ratio of the intensity of the incoming particles' flux to the intensity of the transmitted flux. This ratio generally differs from unity, because not all particles composing the incoming flux are transmitted through the interdimensional interface. Part of the incoming flux is indeed reflected back. Let us emphasize that the reflection mechanism is not here the consequence of the interaction of the incoming particles with some sort of force field. The particles, indeed, are supposed to move freely, and their reflection at the interdimensional boundary is just the result of a genuine quantum effect, due to the discontinuous variation of their effective mass.

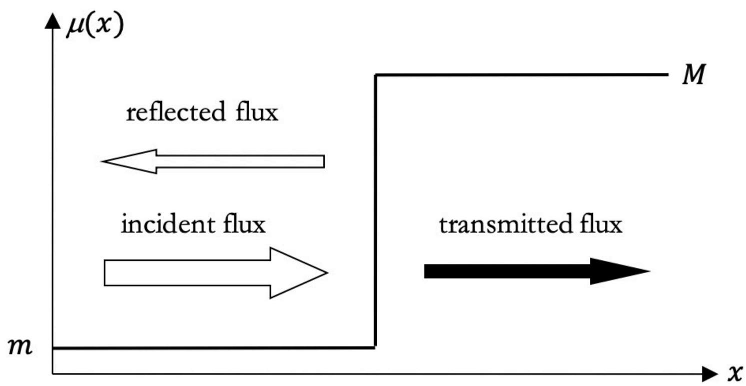

Figure 9 Because of the mass discontinuity, the incident flux of extraphysical particles is split into reflected and transmitted components.

More precisely, the efficiency η is given by the *probability* of a quantum particle of energy E being transmitted through the mass step-barrier. Using the above modified Schrödinger equation, it is not difficult to calculate such a probability (Lévy-Leblond, 1992), which is given by:

$$\eta = \frac{4\sqrt{\lambda}}{\left(1+\sqrt{\lambda}\right)^2}$$

Where, as before, $\lambda = m/M$. We emphasize that exactly the same formula holds for particles traveling in the opposite direction, that is, from the physical to the extraphysical dimension.

Now, for $\lambda = 1$, as expected, $\eta = 1$. Furthermore, as the mass ratio λ tends to zero, the efficiency η also tends to zero, which means that in this limit all particles are reflected back. For the specific ratio $\lambda = 0.001$, one finds $\eta \cong 0.12 \cong 1/8$, which is approximately 30 times better than what we have calculated in our previous classical model. However, we should not compare these two models, neither quantitatively nor qualitatively, as their logics are very different.[4]

Again, we can wonder how the holochakra would function within our position-dependent mass model. To increase the efficiency of the transmission mechanism, one can think of the holochakra as a non-homogeneous crystal-like morphothosene, responsible for a smooth and gradual variation of particles' inertial mass, as a function of their interdimensional position. Indeed, using an adaptation of the so-called *WKB* semiclassical approximation, one can show that for a sufficiently smooth and slowly varying mass function $\mu(x)$, the totality of the incident flux is transmitted, so that the energy efficiency of the process becomes maximal.

12 Concluding remarks

Why do objects have a mass? What is the typical answer physicists today give to this basic and at the same time very difficult question?

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[4] In the previous classical model, the energy transfer mechanism was the consequence of a two-particle collision process, whereas in the present quantum model it is the consequence of a single-particle transmission process through a mass-barrier. One can of course imagine combining these two models into a more sophisticated and integrated picture, considering for instance the more general situation of an N-body system of quantum scattering particles with position-dependent masses. The study of such a model, however, is far beyond the scope of the present paper.

According to physicist and philosopher *Ernst Mach* (1838-1916), inertia cannot exist in an empty space, as it results from the mutual gravitational interaction between all entities populating the universe. This is the so-called *Mach principle*. In 1961, Mach principle has been successfully integrated into Einstein general relativity equations by *Carls Brans* and *Robert Dicke* (Brans and Dicke, 1961) in the form of a variable (in space and time) field determining the intensity of the gravitational forces and consequently (because of the equivalence principle) the inertial masses of the different material objects. This is the so-called *Brans-Dicke's field*.

In the same years, but in a completely different context, *Peter Higgs* (Higgs, 1964) discussed how a field permeating the entire universe (previously introduced by *Jeffrey Goldstone* as a special solution to certain field equations) could be responsible, through its interaction with all kind of particles, for a mechanism of mass generation (a symmetry breaking phenomenon known as the *Higgs mechanism*).

Later on, at the end of the seventies, and thanks to the work of a generation of physicists well-formed both in particle physics and cosmology (in particular *Anthony Zee*, *Lee Smolin*, *Alan Guth*, *Andreï Linde* and *Gabriele Veneziano*), it was realized that the Brans-Dicke's field and the Goldstone-Higgs field are just two different descriptions of a same phenomenon, possibly explaining the origin of inertia in our universe. In addition to the field of Brans-Dicke or Goldstone-Higgs, many authors have proposed alternative mechanisms to explain inertia. Let us mention, as an example, the zero-point-field model of *Haisch*, *Rueda* and *Puthoff* (Haisch et al, 1994).

Anyway, our intention here was not to review today's leading-edge theories regarding this difficult problem, but just to emphasize that according to the most advanced models it seems natural to assume the existence of a field varying in space and time, filling our entire reality, responsible for the attribution of the observed inertial properties to the different entities. This is in good accordance with the heuristic at the base of the present work, considering that the effective mass of physical and extraphysical particles would be the consequence of their overall interaction with a variable and multidimensional field, shaping and demarcating the different physical and extraphysical dimensions.

We already know from relativity theory that the mass of an entity is not a conserved quantity. Indeed, according to Einstein's most famous equation, $E = mc^2$, mass and energy are completely equivalent to one another. In our model, however, when we refer to the mass of a particle what we mean is its *rest mass*, not its relativistic mass. In other terms, the mass variation we have hypothesized is not to be confused with the relativistic increase of the mass of a particle as a function of its velocity.

We can observe that our mass model assumes a decrease of the effective mass of an entity when going from the physical to the extraphysical dimensions. The frequency model, on the other hand, assumes an increase of the frequency of vibration of an entity when going from the physical to the extraphysical. So, it is natural to ask:

Are these two assumptions compatible?

To answer this question, we can consider the paradigmatic example of a *spring-mass system* of elastic constant k and mass m. The frequency f of its harmonic oscillations is given by the formula:

$$f = \frac{1}{2\pi}\sqrt{\frac{k}{m}}$$

Therefore, as the mass of the system decreases, its frequency of oscillation increases, and vice versa. This shows that if we describe an entity as a system possessing a certain amount of potential energy, which can be fully converted into an internal oscillatory movement, then the description of the mass and frequency models are compatible.

The mass (or density) model allows us to understand the energetic separation between dimensions in terms of an inefficiency of the energy transfer. There are of course many examples of parapsychic phenomena revealing the extremely low efficiency of the energy transfer mechanism. One can cite the example of telekinesis, where the rate of success is notoriously very low, and enormous expenditure of consciential energies are usually required to move even the smallest and lightest physical object.

The mass model also points out the necessity of having structures like the holochakra: mediators of a multidimensional nature whose mass (density) varies smoothly and gradually, in order to connect the physical and extraphysical dimensions by improving the efficiency of the interdimensional energy transfer.

Apart from the internal structure of our holosoma, one can of course identify many other situations where the presence of a mediator structure allows for an improvement of the interdimensional communication. A typical example is the so-called *penta* technique [see Vieira (2002), p. 594, and Figure 293], a process during which a helper (an entity pertaining to the extraphysical per se dimension) transmits healing consciential energies to an ill consciousness (an intraphysical projected consciousnesses or an extraphysical consciousnesses having not yet undergone the so-called second desoma). To succeed in the transfer of energy, the helper uses the mediation of the penta practitioner, whose holochakra provides the intermediary-density connecting-bridge between the "light-weight" helper and the "heavy-weight" ill consciousness.

Even more interesting is the *energization by three* technique [see Vieira (2002), p. 696, and Figure 357], where the helper uses two mediators at the same time: a "subtler" projected intraphysical consciousness and a "denser" non-projected intraphysical consciousness. According to our simplified model, it is natural to conjecture that such a double-mediator configuration permits a further gain in efficiency, in comparison to the standard, single-mediator, penta technique.

As a last example of a quasiphysical mediator structure, let us mention the *assistential bioenergetic field*, as implemented for instance during IAC's *Consciousness Development Course–Advanced 2: Assistantial Energetic Field*. Thanks to the connection established between a team of advanced extraphysical helpers (possibly also employing some kind of paratechnology) and the holochakra of the intraphysical epicenter, a temporary multidimensional energetic bubble is produced around the epicenter. We can conjecture that the bionergetic field can reduce the gap between the extraphysical and physical dimensions because it would be made of substances of varying density, i.e. because it would possess a specific multi-layered structure.

To conclude, let us emphasize once more that the validity of our heuristic mass model is based on a number of speculative assumptions (this is the case also for the frequency-model). Not only we have assumed that energy and momentum are conserved quantities in the extraphysical dimensions, but also that physical concepts like mass and density (or frequency and intensity in the frequency model) are still meaningful in non-physical domains. Of course, nothing is less sure than this, considering our limited knowledge of paraphysics.

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