

Fundamental physical constants

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My previous books and articles have all shown the true nature of reality that surrounds us - confirming the granular model of our closed universe; they have also shown a profound relativization imposed to all physical quantities that describe it. As observers located inside this universe, which are only using tools and measuring devices that have the same consistency and granularity as the observed matter, we will obviously face an objective limitation in any analysis of the microcosmos. The observational uncertainty will affect any measurement performed under a certain dimensional scale, altering its value. At quantum level, i.e. the elementary particles' one, it is all about movement, its particularities and about the associated laws and quantities. However, as it has already pointed out, the rules and physical quantities of this dimensional level are all resulting in fact from the motion existing at a lower, sub-quantum level. Here, at granular level, lays the whole mechanics that allows our universe to function at any higher scale. We may find here the absoluteness of the motion, but also its sine qua non, descriptive relativization - if these things are regarded in their whole dynamics, since the beginning. The absolute originates from the unique source (essence) that produced the granular material at *moment zero*, source that also imposed a directional equivalence and an almost perfect uniformity of the three-dimensional space, along with a constant value of the granular impulse/energy. That intrinsic relativization comes from the lack, after *time zero*, of any marks that still may represent the stationary, unique source of matter. On the other hand, we are also dealing with a subsequent dimensional relativization, characteristic to any material structure, which comes from the intrinsic one and from the closeness of our universe. Therefore, it seems normal to look for a set of true fundamental physical quantities, which may completely and absolutely describe the universe and the movement of its structured matter.

1. Considering the previously stated conditions [1], we could now assume the existence of an initial fixed amount of granular material, and therefore the granular number **N** will become an absolute constant of our universe. To support this idea, we have to presume that the granular division ceased definitively after *time zero* and that this phenomenon is irreversible (we can either include or not the division process into *time zero*, depending on the model we choose; however, we will consider here the most recent zero moment). This really big number **N** has been estimated in a previous article to at least a few googol, transforming this way our universe into a special large system, where many important data will only have statistical components.

2. As all granules are identical in shape and size, we can associate them a constant diameter **d**, which, in absence of any other fixed marks, could even be considered as the unit of measure for length. If we assume that the initial shape of the essence was also spherical, its diameter **D** may be:

$$D = d \sqrt[3]{N}$$

3. As the division process ended, all the granules have reached a constant, absolute speed, which will be further denoted by C . This value of speed holds indefinitely, it is not affected by the number of granular collisions (all collisions are perfectly elastic).

4. Being a certain amount of matter in motion at constant speed, a granule will possess granular impulse (momentum) and granular energy (kinetic). These are also fundamental, absolute quantities, constant as values, and they will be denoted by \bar{p} (vector quantity) and respectively e . Note: these two physical quantities, considered in isolated systems of any fixed number of granules, are subject to the laws of conservation.

5. After that *time zero*, the isolated system called universe has undergone a continuous process of expansion, starting from the initial diameter D . We may assume that the absolute expansion speed of the sphere's edge is lower than the speed C (considering the model of a closed universe), and therefore there were granular collisions that changed the granular impulses toward the inside of the sphere. It is equally possible that, in a different model (also alternative to the inflationary theory), this sphere's wall "dissolved" itself and sent the granules toward the inside of the ball. Any model we would take into consideration, three statements are nothing but certain things:

- There are no privileged granular directions on a global scale, which will simply lead to a basic granular postulate related to the quasi-null vector sum of all granular impulses.

- The initial granular density has a maximum value (granules are close to each other), and decreases as the geometrical space expands very fast.

- There are very small nonuniformities in this granular system; anyway, the entire system tends, at any scale would be regarded, to automatically increase in uniformity.

6. We could also define a granular time, derived from the granular speed and diameter, which would have a constant rate. However, it would be more like a virtual quantity, not a fundamental one and neither very helpful to this set of constants.

7. The granular density, as well as the average intergranular distance, is not a constant quantity (already described in [1]). Both of them are very useful instead in some calculations, as the pressure exerted by the granular fluid on compact structures, and they will be included in this basic set - denoted by ρ and respectively \tilde{r} .

8. Within the first few seconds that followed the bang moment (The First Bangs [5]), many granular gradients have soon appeared in that very dense space. As the rules of the granular collisions are well known, it is very simple to explain how the fluxes crossing these areas in all directions have formed many rotational, compact structures (The formation of elementary particles [7]). All these structures got stable shapes and sizes shortly, adapting continuously to the decrease of the granular density (to the pressure exerted by the spatial fluid). This decrease in density of the granular space (the granular structures are not included here) had two main causes:

- The formation of compact granular structures - the elementary particles - representing a significant percentage of all granular material, about 5...30%.

- The volumetric expansion of space, which automatically produce a "dilution" of the granular fluid.

The omnidirectional granular fluxes are generating the phenomenon called gravity and are also maintaining the shape, size and stability of all elementary particles that spontaneously appeared during the period of high granular density. Considering their origin and the huge spatial volume where they are generated, we may reveal their perfect uniformity feature, at any scale - which includes the quantum realm.

Two stable shapes of the elementary particles (and their antiparticles) were presumed to exist, the flat disk (electron, positron and quark) and the torus (neutrino). We may add some other stable formations, such as the gluons in composite particles (containing two or more quarks), also some unstable ones. The elementary particles - of discoidal shapes - have a different concavity or convexity of their side surfaces, a property identified with their "electric charge". Furthermore, all these particles have an internal, continuous motion of precession, characterized by the parameter called *spin*. These latter features lead to the emergence of some force fields around particles, namely the electric and magnetic fields. They can (these fields are composed of *electrophotons*) transmit interactions at a distance, i.e. they may exert certain forces on other particles.

The regular photons, as well as the electrophotons, are all granular structures of specific shape (fixed or dynamic) that results from the granular fluxes combinations, but they are not very compact formations. Therefore, they can only propagate through space at the maximum possible speed (influenced by the local granular density). This maximum speed of photons will be denoted by *c*; it is a derived quantity that results from the granular speed *C*, the local granular density *ρ* (which also includes a certain probability) and the duration of a granular collision. The formula of the maximum speed through the empty space is (speed of light):

$$c = C / (1 + \rho \tau C)$$

where *τ* is the average time of a granular collision (resulting from the granular diameter and the elasticity constant of the primordial material).

If the granular density changes, the intensity of the granular fluxes, i.e. the pressure exerted by space on any compact granular structure, also changes. The balance between the momentum transferred by the granular space and the internal, rotational one, determines the shape and size of all elementary particles. These dimensions will change other quantities, such as the electric charges and therefore the strength of their electric fields. However, all these things are included in the global *relativization* that every physical quantity is facing, which induces in turn a certain *constancy* to all the measured values. It will be very difficult to work with these absolute values of the fundamental physical quantities, but this thing may bring us much closer to their physical significance.

9. As it has already been described [1], the means to explain the quantity (at quantum level and above) named *mass* are based on the external impulse required to change the motion (internal impulse) of a certain particle. Obviously, the mass of a particle depends on the number of constitutive granules and on the value of the granular impulse. Its movement is quite complex, being in fact a combination of the internal precession and the specific motion produced by the nearby fields. This re-orientation of all internal impulses will change, in the local frame of reference, the ratio between its own rotational movement and the external (global, averaged, absolute, translational) one. The "speed" this particle will interact with other ones (through various fields) will change in this way, which is equivalent to a decrease of the local time rate. This relativistic

phenomenon also involves, through the mechanism described above, an increase of the particle's mass, which is reflected similarly and cumulatively at the macroscopic objects' level. We may actually redefine relativity (the one coming from the movement of material structures) as a change of the internal balance between the *absolute* (internal movement) and *relative* (external).

10. Considering that the *mass* may only characterize a structured formation, more or less compact, of granules that have a higher density than the local one, it is natural to see the *energy* associated with this mass as a structured formation of granular energies. Therefore, any particle has a certain amount of mechanical energy (kinetic energy), and its movement through the granular fluid changes the way this energy divides into rotational (internal) and translational (external) ones. The eventual acceleration caused by a field represents in fact the action of a certain force on the particle, and this force is given by the amount of momentum transferred in the unit of time. The energy is neither created nor destroyed at granular level, it only changes the structural form at a given moment, concentrating in various particles or fields.

Conclusion

We have identified eight fundamental physical quantities that fully characterize our universe at granular level: N , d , C , \bar{p} , e , τ , ρ and \tilde{r} ; first six ones are fundamental physical constants, while the last two are correlated and they both are depending on the expansion of space. The granular diameter d could constitute itself a distinct unit of measure, which would characterize the global relativization within this universe. We may further imagine some complex models, which will include all these constants, for any type of particle, atom, field, photon etc., and then we may deduce all their derived quantum properties. Normally, any other physical quantity, at quantum or macroscopic scale, should be connected via certain mathematical formulas with these defining constants. These eight constants are therefore completely giving our granular universe and its actual dynamics.

References

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