The parameter k is determined from the SG forces between the primary balls in the primary tetrahedron. For the primary quasipentagon it will be approximately the same, because these two structures have very close intrinsic matter density. Let us assume that the parameter k does not depend on the type and order of the formation. This assumption is based on the consideration that the structure of the primary QP is preserved in all higher order structures. The matter quantity expressed by the intrinsic mass, however, is dependable on the structure type and order.

Let us determine the frequency of the common vibrational mode for a QP of some upper congregational order p. All lower order structures included in this QP preserve their configuration. So the same parameter k between primary balls should be valid (according to the above made assumption), while the mass of the QP of order p could be estimated by the matter quantity given by Table 12.0.

Having in mind Eqs, (12.5) and (12.6) the common mode frequency of the QP of p-th congregational order could be expressed as:

$$\nu_{QP}^{(p)} = \frac{1}{2\pi}\sqrt{\frac{k}{5N_{PB}m_o(60N_{PB})^{p-1}}} \qquad (12.7)$$

We see, that the common mode frequency falls pretty fast with the order number p. Having in mind the quantum features described by the SGSPM quasisphere, the obtained common mode frequency might be considered as a proper frequency of the SGSPM vector.

Making a ratio between $\nu_{QP}^{(1)}$ and $\nu_{QP}^{(p)}$ we get:

$$\frac{\nu_{QP}^{(1)}}{\nu_{QP}^{(p)}} \approx \sqrt{(60N_{PB})^{p-1}} \qquad 12.8)$$

The mass of the primary PQ is five times the mass of primary TH, but the mass to volume ratio (neglecting the small gaps between TH in the QB structure) is approximately the same. Then parameter k for TH and QP is also the same and the expression of the frequency ratio between IGSRM vectors of the primary TH and the SGSPM of highest order QP in the prism will become:

$$\frac{\nu_{TH}^{(1)}}{\nu_{QP}^{(p)}} \approx \sqrt{5(60N_{PB})^{p-1}} \quad (12.9)$$

Note (1): The factor of 5 refers to the QP's SGSPM, that is a common mode of IGSRM of the included TH's. The real factor might be slightly lower than 5 due to the angular gap in the QP. So SGSPM of TH is approximately equal to 5 times SGSPM of QP (within the same congregational order).

According to the considerations in 12.A.4.4, the Planck's time regarded as a period of IGSRM vector, may correspond to $\nu_{TH}^{(1)}$ or $\nu_{QP}^{(1)}$, while $\nu_{QP}^{(p)}$ could be the SGSPM frequency of the quasipentagons from which the prisms are made.

Let us analyse how the SGRM period changes during the growing process: tetrahedron - quasipentagon - quasiball - upper level tetrahedron.

The SGRM is defined for the primary TH. The period of SGRM may be slightly decreased in the primary quasipentagon, due to the close accumulation of intrinsic mass and obtaining a different shape of SGSPM quasisphere. In a growing process from a QP to a QB within one congregational order the period of SGRM should not be significantly affected, because QPs are connected by small volume sections. In the growing process between a QB and a upper order TH the SGRM period could not be affected significantly because the mean matter density, ρ_{ST}, is approximately the same as of QB. The change of SGRM period in the upper order growing will be smaller and smaller, following a continuously decreasing step function with progressively smaller steps. Consequently:

(a) The change of SGRM of the growing structures is a decreasing steplike function with progressively decreasing steps.

(b) The step change have two periodical progressions:

- between congregational orders

- between different type of structures of same order

12.A.5.3. Hypothesis of embedded fine structure constant in the lower level structures of matter organization

Considerations related to the concept of embedded fine structure constant

From the previous chapters it was shown that the fine structure constant is embedded not only in the electron structure but also in its dynamical properties in CL space and many other interactions between the elementary particles and the CL space (for instance: in the quantum motion of the electron (positron); in the quantum orbits conditions for atoms and molecules; in the atomic and molecular spectra). In Chapter 10 of BSM it was shown that α is also involved in the inertial interactions between the elementary particles and the CL space (Eqs (10.36), (10.39), (10.39a). It was even found that the signature of α is involved in the inertial interaction balance of the solar system in our home galaxy - the Milky way (see §10.6.4, Chapter 10 of BSM).

From the analysis of the lower level of matter organization and the concept of the galactic cycle (provided later), it becomes apparent that α is a common fundamental physical parameter for all observable galaxies. Consequently, α is a parameter of very low level structure and its signature is preserved even in the galactic recycling process (discussed later in this chapter). The basic repeatable structure which possesses SGSPM vector is the primary tetrahedron, so it is reasonable to look for a possible signature of α in this structure. One very basic physical parameter of the primary tetrahedron is the number of primary balls. Keeping in mind that all the shells of the tetrahedron should be completed, a simple rule follows that a strong relation must exist between the number of balls along the edge and the total number of balls. For example, if the edge number of balls, N_{edge}, corresponds to the set: 10, 11, 12, 13, 14, 15, 16, 17, 19 and so on, then the total number of balls, N_{tot}, should be respectively: 220, 286, 364, 455, 560, 680, 816, 969, 1140, 1330 and so on.

The experimental value of the fine structure constant is measured with very high accuracy. Finding a theoretical derivation of this fundamental parameter, however, have been one of the most difficult problems in mathematical physics. (see J. G. Gilson)[1]. In fact number of empirical formulae have been suggested, but without understanding what kind of physical mechanism is behind them. One of these formulae (shown as Eq. (F1)) gives a value, which is very close to the measured one recommended by CODATA 98 (if the two involved integer parameters have value: $n_1 = 137$ and $n_2 = 29$):

$$\alpha = \frac{n_2}{\pi}\cos(\pi/n_1)\tan(\pi/(n_1 n_2)) = 7.2973525 \times 10^{-3} \tag{12.12}$$

$$\alpha = 7.2973525 \times 10^{-3} \quad \text{(CODATA 98)}$$

Recently another simple expression has been proposed by I. Gorelik[2], as a system of two simple equations:

$$n + k = 1/\alpha$$
$$k(n+k) = \pi^2/2$$

I. Gorelik, mentions the derived method but does not provide any association with a possible physical mechanism. The BSM analysis found an excellent association with the oscillating properties of the lower level structures described by SGSPM vector.

The common mode oscillations of the primary balls embedded in the primary tetrahedron could be described by two vectors: SGRM and SGSPM (see §12.A.4.2.1 C). Making analogy with the CL node dynamics, the primary tetrahedron has the same two set of axes: *abcd* (non-orthogonal) and *xyz* (orthogonal). Then to analyze the dynamics of oscillations of the primary tetrahedron, we may use a concept similar as the CL node dynamics (presented in "Brief intro to BSM..." and Chapter 2 of BSM), but instead of NRM we have SGRM and instead of SPM we have SGSPM. One major difference is that the primary tetrahedron has relatively large intrinsic matter density for the volume it encloses, while the CL node has much smaller intrinsic matter density for the volume it encloses. For this reason we must expect much smaller number of SGRM cycles in one SGSPM cycle in comparison to the CL node dynamics (NRM cycles in one SPM cycles). Due to the two sets of axis, the trace of SGRM will not be circular and will note lie in a plane. We may simplify the analysis if replacing the real trace of SGRM with an equivalent elliptical trace having a dipole moment equal to the real precession moment of SGRM vector for one cycle.

Figure 12.8 illustrates the dynamical behavior of the SGRM vector.

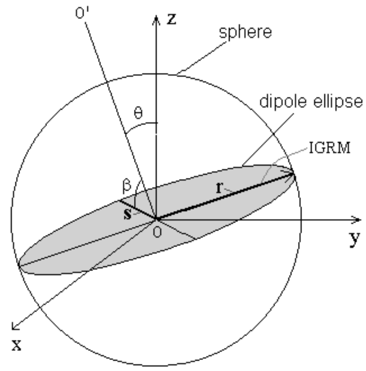

Fig. 12.8. Spatially precessing dipole momentum expressed by SGRM vector.

The origin of the SGRM vector is always fixed at the origin O of a coordinate system *xyz*, while having a freedom to rotate in the spherical space volume. Due to the different stiffness along the two sets of axes xyz and abcd (not shown in this figure), the vector SGRM will perform a helical rotational motion with a very small but constant helical step. This means that after one cycle its tip will not pass through the same point but through a point closer to the previous one, so the distance between them is much smaller than the trace of the vector's tip. We may call this a quasicycle. After many quasicycles, however, the tip of the SPM vector will pass exactly through the same initial point (arbitrary selected). This cycle we may call a full cycle. Then the full cycle will contain many quasicycles, but their number may not be an integer. In this kind of motion, the tip of the SGRM vector will circumscribe a trace, which lies in a spherical surface. It is apparent that for one quasicycle, the trace of the vector SGRM will not lie in a plane, but we may consider an equivalent plane, defined by the condition that the average distances between the points of the vector's tip (through equal time intervals) and this plane is a zero. This will simplify the analysis and will allow us to define the following parameters:

-selection of an initial reference point

-definition of a dipole momentum in a plane

-definition of the step between two neighboring equivalent planes (corresponding to the helical step of the SGRM vector) as an angle between them.

It is apparent that the dipole momentum of SGRM vector could be expressed by an ellipse lying in the equivalent plane. We may call it a "dipole ellipse". The rotational axis OO` will be perpendicular to the major semiaxis r of the dipole ellipse, but not perpendicular to the minor semiaxis. In other words the plane of the dipole ellipse will be rotating with a small pitch angle of $(\pi/2 - \beta)$ defined by the helical motion of the SGRM vector. Then for one quasicycle, the dipole ellipse will sweep a volume of an oblate spheroid with a major semiaxis r and a minor semiaxis defined by the product: $s\cos\beta$.

In every quasicycle, the dipole ellipse will sweep the same volume, while the initial angle θ (arbitrary selected) will change with one and a same step. This angle is shown for reference only. It could be defined for any one of the orthogonal axes. The rate of θ change will define the number of completed quasicycles within one full cycle. The latter, however, may not contain an exact number of quasicycles but a whole number plus a fraction, so we have:

Full cycle = n + k

Where: n - is the number of completed quasicycles contained in one full cycle, k - is a fraction of a quasicycle

Our goal is to express the fraction parameter (k) as a function of the whole number (n) using the defined model. We will derive expression using the relation between the volume of the circumscribed sphere and the volume of the oblate spheroid.

The volume of the circumscribed sphere is:

$$V_{SP} = (4/3)\pi r^3$$

If the full cycle contains a large number of quasicycles, then: $\cos\beta \ll 1$. We may associate this with the fractional part of $1/\alpha$, so we may write: $\cos\beta = k$. Then, the volume of the oblate spheroid is: $V_{OS} = (4/3)\pi r^3 s\cos\beta = V_{OS} = (4/3)\pi r^3 sk$

The tip of the SPM vector is associated with the point of interception of the dipole ellipse with the major semiaxis. This means that for a full cycle of the SGRM vector, the volume of the oblate spheroid swept by the rotating dipole ellipse will be twice the volume of the circumscribed sphere, or we have $V_{OS} = 2V_{SP}$. The expression corresponding to this is:

$$(4/3)\pi r^3 sk(n+k) = 2(4/3)\pi r^3$$

Multiplying both sides by 1/r and using a normalized parameter $s_r = s/r$, we arrive to:

$$0.5 s_r k(n+k) = 1 \qquad (12.13)$$

Now we may look for a possible reasonable value of the product $(s_r k)$, while trying to relate the parameter s_r to π. Knowing that (n+k) is equal to $1/\alpha$, we should have $0.5 s_r k \approx \alpha$. For this purpose we will use the experimental value of alpha given by CODATA 98. Then the normalized minor semiaxis of the oblate spheroid should be close to the value: $s_r = 0.40552$. This value is very close to: $\left(\frac{1}{\pi/2}\right)^2 = \frac{4}{\pi^2} = 0.40548$. The difference between them is only 0.59%, so we may accept:

$$\sqrt{s_r} = (2\pi) \text{ or } s_r = 4/\pi^2 \qquad (12.13.a)$$

The idea to relate the parameter s_r to π is reasonable if examining the more accurate formula (12.12), where π participates. It complies also with the Feynman's idea[1] that alpha should be somehow connected to the numbers *e* or π.

Substituting (12.13) in (12.13.a) leads to Eq. (12.13.b). It is a quadratic equation. The root leading to a correct expression for alpha is:

$$k = -0.5[(n^2 + 2\pi^2)^{1/2} + n] \qquad (12.13.b)$$

Using the module of the solution (10) and combining with the expression $(n+k) = 1/\alpha$ we get the explicit theoretical expression for the fine structure constant (denoted as α_c)

$$\alpha_c = 2/[(n^2 + 2\pi^2)^{1/2} + n] = 7.29735194 \times 10^{-3} \qquad (12.14)$$

Conclusion: In the obtained equation for theoretical value of the fine structure constant only one number must be selected: n.

Equation (12.14) provides a pretty accurate value for alpha, if the accuracy of its experimental value exceeds some level. This requirement is overly satisfied that is evident from the plot illustrated by Fig. 12.9, according to which we can use n = 137 with a high level of confidence.

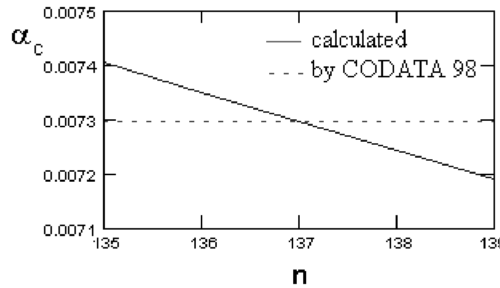

Fig. 12.9. Plot of the fine structure constant, by the theoretical Eq. (11) (blue line) and by CODATA 98 value (red dashed line). The experimental accuracy better than 0.7% allows to use only n =137 for which a quite accurate value for the fine structure constant is obtainable.

Discussion:

The suggested method provides a simplified physical picture of the common oscillating mode in the primary tetrahedron, whose signature is the fine structure constant. Evidently, the fine structure constant is defined by the intrinsic features of the primary ball: an intrinsic time constant and a level of deformation. These two parameter are constant for primary balls of both types of intrinsic matter.

References:

1.J. G. Gilson, Fine structure constant, http://www.btinternet.com/~ugah174

2.I. Gorelik, Formula for fine structure constant, www.geocities.com/Area51/Nebula/3735/fine.html

12.A.6. Super Gravitational Constant

12.A.6.1. Difference between SG constants G_{os} and G_{od}.

The Super Gravitational constant G_o has been introduced and partially discussed in Chapter 2 of BSM. Now keeping in mind the oscillation properties of the primary balls and TH, QP and QB formations of any congregational order it becomes apparent that SG field could be defined by the interaction energy E_{IG} between two structures of a same type placed in a void space at unit distance. It is reasonable to chose a stable length parameter for a unit distance. For this reason we must be able to scale the chosen unit distance to the dimension of the primary ball. This distance is preserved in all upper order structures. Having in mind the robustness of the formations from intrinsic matter including the prisms it is apparent that the prism length could be also used as unite length. (When analysing phenomena in CL space, however, we consider the internode distance as an unite length keeping in mind that it is only weakly dependable on the mass of a large body (a General Relativity effect).

From the presented in §12.A.4.2 and §12.A.5 scenario of the prisms formation it becomes apparent that the prism is formed of aligned quasipentagons of one and a same order (and from one type of intrinsic matter substance). The analysis made for the prisms should be valid for the structures of the same congregational order. Because we have two types of intrinsic matter substances, we must consider two types of SG constants:

G_{os} - is the SG constant between structures of intrinsic matter substance of same type

G_{od} - is the SG constant between intrinsic matter substances of different type.

The volume ratio between the primary balls from the two substances should be equal to the prisms volume ratio $V_1/V_2 = 27/8$. Then the radius ratio of the primary balls is $r_1/r_2 = 3/2$. Even without knowing the common estimated mass density and the force constant, it is evident that the SGRM vectors of the primary tetrahedrons of both substances will have **different periods** (estimated by a common time base). SGSPM vectors (for TH, QP or QB) of both substances will have a period multiple of SGRM period (for the primary ball).

Let us accept that a complete SG energy exchange between the spatially separated structures (in a void space) is achieved for a finite time, defined by the time constant of the intrinsic matter, t_{IM}. While it is intrinsically small and could be near the range of the Planck's time, it is quite important. As discussed in Chapter 2 of BSM, without such constant the energy conservation could not be defined, while all analysis and observations show that this principle is an iron rule.

Let us associate the intrinsic time constant, t_{IM}, with the cycle of the SGSPM frequency. From the analysis of the SGSPM frequency in §12.A.5.2 we found that it decreases as a step like function in the growing process of lower level of matter organization. Consequently, the secondary time base will be respectively an increasing step-like function.

Let us consider the two types of prisms which play the role of basic elements of CL space. While keeping in mind that the prism has anisotropic SG field, let us focusing on its axial SG field. Since the prisms are formed of aligned QPs, the combined SGSPM of the QPs will define the SGSPM vector of the prism.

Let us consider two cases of spatially separated prisms in a void space.

(1) Case: The prisms are of same intrinsic matter and handedness

(2) Case: The prisms are of different intrinsic matter and handedness

Then the interaction SG energy could be presented as integration of SGRM cycles for the time duration of the SGSPM cycle.

The complex trace of the SGRM vector for a full SGSPM cycle is difficult to be expressed mathematically. We may simplify the problem, by replacing this two vectors with a simplified model of linear interaction between two slightly different frequencies and estimate the product of their interaction. Then the analysed problem could be regarded as the energy transfer between two PLL (phase looked loop) oscillators. The case (1) corresponds to two PLL oscillators with equal proper frequencies ($a = 1$). They need very short time interval in order to get in synchronization and exchange energy. The case (2) corresponds to two PLL oscillators with slightly different proper frequencies ($a \neq 1$). They need a significantly larger time interval and at different moments the biting effect could be constructive or destructive. The associated energy exchange for this simplified model is given by the expression.

$$E_{SG} = \int_0^{\theta} \sin(2\pi\theta)\sin(a2\pi\theta)d\theta \qquad (12.15)$$

$a = f_1/f_2$ - is the frequency ratio associated to the ratio of SGRM frequencies of the two types of prisms.

For case (1) we have $a = 1$, while for case (2) this factor is $a \neq 1$.

Figure 12.12 shows a plot of E_{IG} for case (1) - the black line ($a = 1$), and for case (2) at three values of a parameter: 0.6, 0.66 and 0.73.

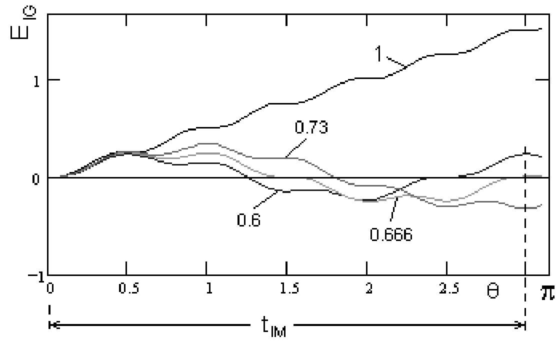

Fig. 12.12. Plot of E_{SG} for different value of a parameter.

While for case (1) the interaction energy is always positive, for the case (2) the interaction energy for elapsed time of t_{IM} (corresponding to SGSPM) could be positive, zero or negative, depending on the value of the parameter a. **When considering that the two prisms are part of a lattice structure from the aspect of the energy conservation principles, the negative interaction energy will cause an increase of the CL node distance until the total energy balance is restored.**

It is interesting to analyse the expression by replacing the factor of 2π with 4π and integrate up to 4π. This may simulate better the SGRM, which in fact rotates in 4π spatial angle. While it is still not equal to the real model, it shows that the plot for $a = 1$ drops to zero for some particular values of θ. This leads to one important conclusion: <u>In some particular arrangement of the prisms, the SG attraction could be lost for a finite time.</u> Evidently such effect could appear only for extremely short time interval, because the SGRM and SGSPM frequencies of the prisms are slightly influenced from their common positions and distances, especially in a lattice configuration.

Despite the simplicity of the model, it allows to make some important **conclusions**.

A. The attraction between the same type of prisms is always stronger, but in some particular structural arrangement it may be decreased significantly

B. In the CL structure where the prisms are arranged alternatively in nodes, the node distance is supported automatically, due to the slight dependence of the SGRM and SGSPM frequency on the CL node distance.

C. The influence of the interaction energy allows deeper understanding the physical meaning of the two SG constants, G_{os} and G_{od}

The conclusions A. and B.put a light on the stability of the LC structure of the physical vacuum and the structural stability of the elementary particles. The conclusion C. puts a light on the non-mixability of the low level formations from the two different substances. This is important feature in the phases of matter evolution during the hidden phases of the galactic cycle.

Note: The evaluation of both SG constants is only possible by the parameters of CL space, so the asymmetrical factor a_{sym} should be taken into account when necessary (see §6.9.4.2 in Chapter 6 of BSM, related to a_{sym}).

12.A.6.2. Intrinsic time constants of the prism.

The provided concept of SG energy exchange between low level matter formations shows, that the SGSPM cycle defines one important feature of the prisms - their **intrinsic time constant**.

When the concept of SG interaction was introduced in Chapter 2 of BSM, it was emphasized, that the intrinsic matter of the prisms should posses intrinsic time constant. Only in such way a finite time could be assign to any interaction process. This is a very important requirement for assuring a finite energy exchange in any kind of interactions, or in other words complying to the energy conservation principle. Having in mind the prism's internal structure of aligned QPs, as shown in fig. 12.3, we arrive to the following conclusion:

The intrinsic time constant of the prism is defined by the SGSPM period of the uppermost quasipentagons, which are embedded in the internal prism's structure.

It has been mentioned in the previous chapters (and used in analysis) that the SG field of the prism exhibits an axial anisotropy. The above defined time constant is valid for the prism's axis direction. In a direction normal to the prism's axis another time constant might be important defining the radial SG field of the prism. This time constant may have a cirality feature, so it could be related to the period of SGSPM vector of the most upper order quasiballs (possessing twisting that defines the handedness) embedded in the QPs from which the prism is built. Having in mind that the QP contains a large number of lower order QBs the radial SG field time constant might be much shorter than the axial SG field one. In such case one important feature of the prisms could be explained: why the prisms of CL nodes do not stack together. They may stack only if the prisms are axial aligned and closer below some critical distance. Such condition may appear only in a very special environment where a crystalization of helical structures from a same type of prisms is possible. The scenario for such process is described in §12.A.11.3.

Summary:

- **- both types of prisms have own set of intrinsic time constants: one per axial direction and another one per radial direction**
- **- the prisms of CL nodes are not stacked due to the different value of their axial and radial intrinsic time constants**
- **- free prisms may stick along their long side if they are closer below some critical distance. (valid only in suitable environments for crystallization of helical structures from which the elementary particles are built.**

12.A.6.3. About the possible equivalence between G and G_0 that could allow an estimation of the intrinsic masses of some low level formations.

12.A.6.3.1. Considerations

In CL space the both SG constants could appear as one constant properly corrected by CL space asymmetric factor. The Planck's time (see Eq. [(2.67)]) is defined by the gravitational constant G which is valid for CL space. The analysis in §12.A.5.3 shows that the embedded fine structure constant could be directly related to the Planck's time. Then one may speculate that the Super gravitational constant G_0 (expressed by CL space parameters) might be the same as the universal gravitational constant G. At first glance, this conclusion may seem hypothetical because the SG forces are quite much stronger than the Newton's gravitation. But when expressed by the equation of the SG law these forces may appear large due to the larger intrinsic masses (involved in the elementary particles) and the inverse cubic dependence of the forces on the distance.

If the above consideration is true, then the intrinsic masses of all structures from the lower level of matter organization including the primary ball could be found (if the parameters N_{tot} and p discussed in §12.A.5.3 are correctly determined).

Note: The intrinsic mass could be estimated only by the units valid for CL space. In such aspect the asymmetric factor should not be discussed here with the presumption that it is valid when distinguishing the right-handed from the left-handed prisms.

12.A.6.3.2. Equivalent intrinsic mass and matter density of the CL node

The two types of prisms are respectively from two different intrinsic matter substances, but the intrinsic mass related to the SG law we may estimate only in CL space using the Newton's mass unit. For this reason we call it an equivalent intrinsic mass.

The factor C_{SG} has been accurately determined in Chapter 9 as:

$$C_{SG} = G_o m_{po}^2 = 5.276867\times10^{-33} \qquad [(9.25)]$$

where: m_{po} - is the intrinsic mass involved in the proton (neutron).

The similar factor for a Newtonian gravitation is:

$$C_N = G m_p^2 = 1.866772\times10^{-64}$$

where: G -is the Newtonian gravitational constant and m_p - is the proton mass.

We must keep in mind that C_{SG} is related to the inverse cubic law, while C_N - to an inverse square law, so they have a different dimensions. Then, the following analysis could be valid if the assumption that $G = G_o L_{SI}$ is correct, where $L_{SI} = 1(\mathrm{m})$ is the unit length in the system SI, in which both factors are compared. Then we have:

$$\frac{G m_p^2}{C_{SG}} = \frac{G m_{CL}^2}{G m_{CLo}^2} \qquad (12.15.a)$$

where: m_p is the Newtonian mass of the proton, G_o - is the intrinsic gravitation, m_{po} is the intrinsic mass of the proton, m_{CL} - is the CL node inertial mass (CL node mass as a Newtonian mass), m_{CLo} - is the intrinsic CL node mass expressed by the Newtonian mass.

The inertial node mass has been determined in Chapter §2.11.3, Eqs (2.48) and (2.57):

$$m_{CL} = 6.94991 \times 10^{-66} \text{ (kg)}$$

Solving Eq. (12.15.a) for the intrinsic mass of the CL node, m_{CLo}, we obtain the intrinsic mass of the CL node:

$$m_{CLo} = m_{CL}\sqrt{\frac{C_{SG}}{m_p^2 G}} = 3.691 \times 10^{-50} \quad (12.16)$$

Now we may calculate the approximate value of the CL node matter density. In \$.211.3, Chapter 2 of BSM the CL internode distance was found to be $d_{nb} = 1.0975 \times 10^{-20}$ (m). Let us accept that the aspect ratio (length to diameter) of this prism is obtained initially by the first crush of the higher order QB into QPs in a way that the QPs become axially aligned and it is preserved in the further process of moulding. Then we may obtain the approximate aspect ratio of the prism using the relative dimensions of the QP shown in Fig. 12.2. One prism will contains 12 QPs, so the obtain aspect ratio is

$(diameter)/(length) \approx 1/5.4$

If assuming a gap of 1/3 of the internode distance we obtain:

prism diameter: 1.04×10^{-21} (m)
prism length: 5.616×10^{-21} (m)
prism volume: 4.45×10^{-63} (m^3)

Keeping in mind that the CL node contains four prisms, we get the CL node matter density.

$$\rho_{node} = 2.07 \times 10^{12} \text{ (kg/m}^3\text{)}$$

Having in mind that the two prisms are formed of two intrinsic matter substances with different densities, the obtained value for the prisms density must be considered as an equivalent one.

12.A.6.4. Summary about the gravitation

(A) The Super Gravitation can be regarded as a result of energy interaction process between intrinsic matter objects in empty space

(B) The SG vibrations in QP are characterized by the SGSPM vector. All upper order QPs from one prisms have synchronized common mode of their quasispheres

(C) SG forces of the prisms exhibit anisotropy due to the strong alignment of the higher order quasipentagons

(D) The propagation of SG forces between prisms in empty space is carried out by the SG-SPM vector

(E) SG forces between prisms of the same type (substance) are quite stronger than SG forces between prisms of different types, but in some particular cases they may decrease significantly

(F) The handedness of the SG field of the prism is memorized in its lower level structures. Some of the lowest level memory about the handedness (cirality) is able to survive the prism's recycling process (taking place in the galactic cycle).

(G) The Newtonian gravitation is a propagation of the Super Gravitation in CL space environments for a long range distance. The velocity of its propagation is limited by the CL node resonance frequency, which defines also the light velocity.

The feature (E) may explain the refurbishment of the lattices in some particular cases.

12.A.8. Processes of primordial bulk matter of two substances leading to eruption

12.A.8.1. Considerations for the low order structure growing

Let consider a quantity of bulk matter (of primary balls) of a single substance only, possessing the lowest possible energy. In such conditions even a primary tetrahedrons could not be stable, because it posses increased total energy due to the common mode oscillations described by the SGSPM vector. If a second bulk matter of same substance approaches and collide with the first one, the resultant object will obtain energy larger that the sum of both individual energies. Then the energy to mass ratio of the new object of bulk matter may increase to a level when conditions are obtained for creation of PTs and even primary QPs and QBs. The primary QB already have a possibility for 1 bit memory and due to a common mode interactions only one of both states (right or left-hand twisting) will domi-

