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Emergent Quantum Gravity

Deep Bhattacharjee
Electro-Gravitational Space Propulsion Laboratory, India
Integrated Nanosciences Research, India

Abstract:

The most common scenario regards to quantum gravity is how gravity can be quantized? This facilitates a peculiar problem of ultraviolet divergences that has been shown in [1] in Einstein – Hilbert action that from loop (2) onwards in the $\Gamma^{(2)}_{k\longrightarrow\infty}$ where there are unperturbed actions where divergences are so nasty that one needs a correction and thus this has to be cut off using Λ.

The main focus of this paper is to negate the divergences by means of a concept called quantum clustering that arises out of geometric insertions in Branes where the leakage of gravity from our 4 – dimensional universe can be hypothesized to form a cluster action over co-dimensional branes that in a way act as a regulator to perform the recoiling actions developed in those higher dimensional branes with a large number of lower dimensional Brane being chaotic and makes a looping because of the recoil actions arises from the bifurcations of those intersecting Branes where the maximum concentration of graviton can be found making them free from divergences.

Keywords: Quantum Gravity, Quantum Looping, Quantum Clustering.

Methodology:

In our four-dimensional universe gravity acts as a $mass\ 0\ spin\ 2$ graviton being a Boson has a supersymmetric partner fermion called gravitino. It is quite natural from the string theoretic concepts that gravity being a closed string moves or leaks to higher dimensions and thus originates the hierarchy problem as discussed in [2].

From the LHC experiments, graviton has not been properly observed because of its nature as a closed string it leaks and escapes to higher dimensions [3]. In the Brane world scenario, it is convenient that gravity can not only escapes but also (here) it has been hypothesized and very much plausible that they cluster in the higher dimensions or might be escaping into the bulk. Thus, the amount of graviton produced in our universe is far less than the amount of graviton that escapes and clusters in the higher dimensional Brane or bulk [4, 5].

Electronic address: itsdeep@live.com

Realizing this fact one can safely assume the origin of gravity is from the fundamental structure that is strings. And as it has been shown that each of the particle that corresponds from the string vibrations is from the generator schemes of the genera of compact K$\ddot{a}$hler having Ricci flatness. Therefore, in the fundamental grid there is a hypercomplex manifold and any string originates through the cycles of the generator $\nabla_{(p,q)}$ [6].

This is needless to say that unlike gravity there's some open strings like photons which are bounded by the Branes and thus can't escape to higher dimensional bulk. However, graviton can as it is not an open string, thus from the grid containing the hypercomplex structures, one if continues a map that takes the fundamental generator of graviton $\partial|_{\nabla_{(p,q)}}$ through each of the branes from the least to the highest then the generator can act as a canonical projection for an affine parameter $\tilde{\partial}$ showing [5,6,7],

$$\tilde{\partial} := \zeta \xrightarrow{\subset} \bigvee_{\left\{\partial|_{\nabla_{(p,q)}}\right\}_{\partial\equiv i}}^{\partial\equiv j} \left\{\tilde{\partial}\right\}_i^j$$

To consider the canonical projection this has been assumed that there lies a conjugation between the integral of the least dimensional Brane i to the highest dimensional Brane j for the propagator P acting as a constant,

$$P\int i \wedge j$$

This propagator P makes the canonical projection to higher dimension via the projection operator $\tilde{\partial}$ where the fundamental generator of graviton remains always outside the Branes and as the propagator makes a conjugation of the gravity one has to specify two nontrivial things,

1. The limit of the propagator which at the k forms the clustering.
2. The generator of gravity $\partial|_{\nabla_{(p,q)}}$ is outside the standard model and hence its an exterior product when concerned over the conjugation operator $i \wedge j$ which is mainly because it acts as a source of closed string without any boundary attachment to Branes.
    a. Thus, to frame the equation taking [Point 1] one can definitely say that,
    $$\lim_{i\to j} k$$
    Forming the quantum cluster function of $\partial|_{\nabla_{(p,q)}}$ as ∂k.
    b. From [Point 2], if we parameterize $i \wedge j$ then i is a co-chain and j is a chain complex with repeated but continuous intervals between successive Brans,
    $$d_i \xrightarrow{\cap_0} d_{i+1} \xrightarrow{\cap_1} d_{i+1+1}, \dots\dots, \xrightarrow{\cap_1} k$$
    $$k \xleftarrow{\cap_1}, \dots\dots, d_{j-1-1} \xleftarrow{\cap_1} d_{j-1} \xleftarrow{\cap_0} d_j$$

Therefore, at point K there exists the quantum cluster function ∂k that is in essence,

$$\sum_k \partial|_{\nabla_{(p,q)}}$$

Thus, the projection that has been oriented as a chain and co-chain complex can act outside the Branes and gives the $k-$ interval as,

$$k_i \vee k_j$$

Thus, making the quantum cluster function independent of Branes. Still, there should be operations that can make the quantum cluster free from divergences and that operation is denoted by the projection parameter $\tilde{\partial}$ for which the propagator P makes the operation of $k-$ interval through the recoiling parameterization,

$$r \oint_\sigma$$

Taking into effect the cluster function where the propagator P propagates the closed string graviton from the lower dimensional to higher dimensional branes for the higher dimension to be treated as per the cluster function ∂k the cluster is eventually becoming a loop to be described later where this particular function when gets propagated then this will accumulate the leaking graviton to the higher dimensional Branes (specifically in between them) before escaping to the bulk. Thus, any propagator is making a canonical projection $\tilde{\partial}$ for the loop to be considered as the origin of the fundamental source in d^i dimensions and then to d^j dimensions for the concerned dimensional value as $d^c \in k$ for every $d^c \subseteq d^j$ where d^c stands for the co-dimensions or for d dimensions d^c is equivalent to $d-1$ dimensions. Therefore, it is not hard to believe that in case of d^j dimensions one can easily assume that it contains several co-dimensions as such d^j-1 co-dimensions that in general gives the birth of the geometric insertion.

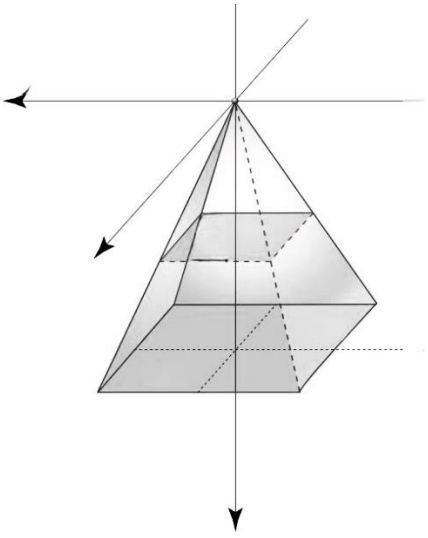

Figure: This picture represents the co-dimension as such, the three dimensional object when is passing through a two dimensional plane which is exactly 3D—1=2D then anything that is there in this two dimensional plane can perceive the three dimension as a blob changing shapes as it passes or crosses the object which is indeed what has been explained here, only the cross sections are visible in case of a higher dimension having a lower dimension or a co-dimension and this cross section can in essence gives the freedom to change the shape from a square in the south pole to a point at the zenith. It is impossible for anything on the plane to visualize the three-dimensional object except the cross sections.

At the end of the $K-$ interval there are numerous cross sections of co-dimensions which can be collectively taken as,

$$\sum \rho$$

$$\exists \int d^c \equiv \rho$$

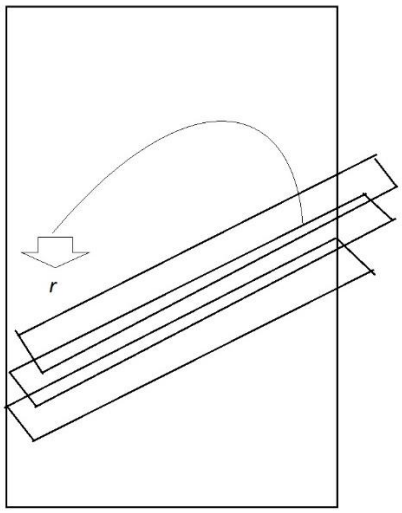

Figure: At the end of the K – interval in the d^j branes there exists several d^c branes which when accumulates then the Brane gets chaotic because of geometric insertion and therefore these disturbances originate bifurcations in several channels where on of the channel is shown in the diagram as downward for a proper representation and understanding of the scenario described in the paper. This thus gives the structure as a source of opposite force or recoiling r which travels down the branes from the d^j to the d^i Branes that gives the disturbance channelize to the lowest order Branes cancelling out the divergences in the form of quantum looping.

Considering the chaotic nature of the disturbances, it is quite easy to approximate the situation that there must be a recoil giving the relation as expressed before,

$$r \oint_{\sigma}$$

Where the recoiling is a constant parameter and any such disturbances would either be in a fault to the quantum divergences or in a negation to the quantum divergences for the parameter,

$$\cap_n$$

$$\exists n = interval$$

This gives rise to the projection for the recoiling mode such that it is opposite and this negative to the original canonical projection taken. The original projection is from the fundamental level to the higher order Brane where the recoiling projection for the downward channel is from the higher order brane to the fundamental limit in a way,

$$\widetilde{-\partial} := \zeta \xrightarrow{\subset} \bigvee_{\left\{\partial|_{\nabla_{(p,q)}}\right\}_{\partial \equiv j}}^{\partial \equiv i} \left\{\tilde{\partial}\right\}_j^i$$

Thus, this induces quantum looping σ and therefore a total cancellation of the divergences where the looping can be denoted as the fundamental graviton being in downward propagation gives rise quantum origins of gravity without any divergences as this has been cancelled out by quantum looping due to recoil effect. This looping gives a complete cycle of cancellation through a contour integral.

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