Non-Commutativity over Canonical Suspension H for Genus $\mathsf{G} \geqslant 1$ in Hypercomplex Structures for Potential $\rho\Phi$

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Non − commutativity over canonical suspension η for genus $g \geq 1$ in hypercomplex structures for potential ρ_ϕ

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Abstract
Any matrix multiplication is non-commutative which has been shown here in terms of suspension[‡], annihilator, and factor as established over a ring following the parameter k over a set of elements upto n for an operator to map the ring R to its opposite R^{op} having been through a continuous representation of permutation upto $n-$ cycles being satisfied for a factor ƒ along with its inverse $ƒ^{-1}$ over a denoted orbit γ on $k-$ parameterized ring justified via suspension $\eta \in \eta^0, \eta^1$ implying the same global non-commutativity for the annihilator $\mathcal{A}$. This will be used for the construction of the genus–alteration scenario where the suspension η^0 acting with its opponent η^1 on any topological space $\mathcal{J}$ can alter the geometry making a change in the manifolds for taking over the Boolean $(1,0)$ satisfying the concerned operations.

Method
Suspension over a topological space $\mathcal{J}$ can induce its inert geometry making it bend or create genus ≥ 1 which imparts a relation that the same space can be transformed into an algebraic category if we make a grid over that space and in each intersection of the aforesaid grid, the manifolds that are existent in hypercomplex form can be changed from their one structure to the other resulting a change in the number of genera thereby inducing a different category of alterations. But this can only suffice if the suspension functor η^0 can be grouped with another suspension functor that opposes its own kind η^1 as while η^1 creates genus, η^0 removes or destroys the genus provided there exists two relations,

1. Two hypercomplex for concerned functors $\eta^1, \eta^0 \; \exists \eta \in \eta^0, \eta^1$ are non-commutative as appeared in annihilator $\mathcal{A}$.
2. There exists the relation of equivalence closure for the affine parameter ∂ through ring $R = \oplus^k \; where \; \partial = \coprod_{\omega=\infty} (\eta^0, \eta^1)^\omega / \sim$ over a value of $\omega = \infty$ for an infinite hypercomplex manifold present in topological space $\mathcal{J}$ but to each one of them the operation is closed for the parameter ∂.

Results
In space-time grid there are multiple compact K*ä*hler with Ricci flatness or vanishing Ricci curvature with different supersymmetric phenomenology related structure that they denote. Considering the genus geometry, for a particular hypercomplex structure if the operation of suspension in Boolean over η^1, η^0 satisfies then for the taken parameterization k of ring R being defined over an affine parameter ∂ through that same ring with also its opposite denoting the alteration operation that can spread over multiple hypercomplex structures, one needs to be careful that the operation is closed via equivalence on one hypercomplex structures else the effective geometric suspension of both types of Boolean $(0,1)$ where to categorize properly this can be considered upon as a viable representation,

1. I'll categorize hypercomplex structure $\mathcal{H}$ with the number of genera as its sub, viz, $\mathcal{H}_1$ as a hypercomplex with 1-genus, $\mathcal{H}_2$ as a hypercomplex with 2-genus and so on, where this example is trivial just to denote and explain the taken parameters.
2. If I denote a hypercomplex with 3-genus then I would categorize this from 1 to 3 in the set notation $\mathcal{H}_3 = \{1,2,3\}$ and another one with 4-genus as $\mathcal{H}_4 = \{1,2,3,4\}$ with so on for more genera.
3. η^0, η^1 will always act on $\mathcal{H}_g$ with g being the number of genus where 0 and 1 in η denotes the suspension or not through the resultant orbit γ being open or closed making the order in a way as to represent the previously said affine parameter closed through ∂ for $\omega = \infty$ for an infinite hypercomplex manifold present in topological space $\mathcal{J}$ that would act in 2 ways via disjoint union among hypercomplex $\mathcal{H}_g$ with the other $\mathcal{H}_g^{\wedge/}$ for $\mathcal{H}_g$ with $g = 4$ represented via $\mathcal{H}_g^{\wedge/} = \{1,2,3,4\}$ and $\mathcal{H}_g^{\wedge}$ with $g = 2$ represented via $\mathcal{H}_g^{\wedge} = \{1,2\}$ with $\wedge = 0 \; or \; 1$ and $/$ associated with $\mathcal{H}$ simply denotes the two different hypercomplex without arising any confusion η will act in the geometry alteration of genus g through the resemblance of (trivial just to denote the case) but (non-trivial in respect of operations at Planck's scale) if η_0 acts on $\mathcal{H}_g^{\wedge/}$, i.e., $\mathcal{H}_4^{0/}$ and η_1 acts on $\mathcal{H}_g^{\wedge}$, i.e., $\mathcal{H}_2^1$ then this suffice for two such hypercomplex structures where $\oplus^k \; where \; \partial = \coprod_{\omega=\infty} (\eta^0, \eta^1)^\omega / \sim$ over a value of $\omega = \infty$ closed for infinite hypercomplex manifold,

$$\mathcal{H}_g^{\wedge/} \coprod \mathcal{H}_g^{\wedge} = \mathcal{H}_4^{0/^*} \bigcup \mathcal{H}_2^{1^*} = \{(1,0),(2,0),(3,0),(4,0),(1,1),(2,1)\}$$

$\exists \mathcal{H}_4^{0/^*} = \{(1,0),(2,0),(3,0),(4,0)\}$ and $\mathcal{H}_2^{1^*} = \{(1,1),(2,1)\} \; \forall \coprod_{\omega=\infty} (\eta^0, \eta^1)^\omega / \sim$ with the annihilator $\mathcal{A}$ representing globally non-commutativity for factors ƒ, $ƒ^{-1}$ in matrix multiplications

Keywords and phrases – Operators; Non-Commutativity; Annihilator; Boolean

Reference – 10 titles

[‡]This suspension η appears in the Preprint https://doi.org/10.21203/rs.3.rs-1798323/v1 in form of canonical stabilizers $2^2\eta$[Ref. 5]

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I. INTRODUCTION

As mentioned in paper[Ref. 5] the structural suspension for functor η over the canonical stabilizer points $2^2\eta$ for genus $g \geq 1$, no such higher dimensional generalizations have been considered or computed. Here, in this paper, I have taken the same suspension functor η which in a way can alter the genus g depending on the commutativity or non – commutativity as depicted over map φ^x. The non-trivial question that can arise is 'why should one considers the commutativity and non-commutativity when it comes to suspension functor η in genus $g \geq 1$, scenario?'. Taking the affine parameter ∂ where $\partial = \coprod_{\omega=\infty}(\eta^0, \eta^1)^\omega/\sim$ (not to be confused with the parameter of the paper in Ref. 5) over a value of $\omega = \infty$ for an infinite hypercomplex manifold existing in intersection points of grids in space-time geometry, any operator $\mathcal{O}$ when makes a proper orbit γ that is for the n-cycles permutations over factor $\mathfrak{f} \simeq$ effective operations in ring R with its inverse $\mathfrak{f}^{-1} \simeq$effective operations in opposite ring R^{op} for 1,2,3,4 $\ni x$ over map φ^x, the orbit $\gamma = \sum_{x=1}^{4}\varphi^x \cong \prod k$[as explained in details in Sec. II] there exists commutativity or no-suspension if the mapping through n-cycles with the denoted orbit makes a trajectory from the domain to the codomain back to the domain or otherwise back to the point of initiation then the orbit γ will be closed; there will always be a false Boolean (0) denotes no change or alteration in the geometries of the hypercomplex structures, but if the point of initiation and point where the orbit ends is not the same then the orbit will remain open implying a non-commutativity over a true Boolean (1) denotes the suspension as the gap $-$ difference all computed for orbit $\gamma \cong \prod k$ over ring $\bigoplus^k$ is sufficient to alter the genus geometries via suspension through the functor η^1 $\forall \eta \in \eta^0, \eta^1$ where the $gap\ \rho$ denotes the non-commutativity to suffice in the following relations,

$gap\ \rho$ is non-existent iff $domain \longrightarrow \cdots \longrightarrow codomain \longrightarrow \cdots \longrightarrow domain$ establishes for 1,2 $\ni x$ over map φ^x

$gap\ \rho$ is existent iff $domain \longrightarrow \cdots \longrightarrow codomain \longrightarrow \cdots \longrightarrow domain \longrightarrow \cdots \longrightarrow codomain$ establishes for 3,4 $\ni x$ over map φ^x

Establishing the properties,

n^{th} order cycles in $domain \longrightarrow \cdots \longrightarrow codomain$

Makes suspension η

For difference or open orbits of γ

$codomain - domain \simeq gap\ \rho \Longrightarrow open\ orbits \equiv non - commutativity$

Over $commutative\ /\ non - commutative\ parameter\ \mathcal{C}$[appearing in Sec. III]

In Topological space $\mathcal{J}$

For construction, I will take a 4-tuple relation to justify the suspension provided all other necessary relations will be there co-existing beside these 4-parameters. This 4-tuple can be represented through,

$\left(\tau(\nabla^y), \iota^\lambda, /_{\ell^\lambda}, \chi^\lambda\right)$ such that $\forall \lambda = 1$ or 0 $where$ $(0,1)$ is Boolean and y in ∇^y takes values 1 or -1[as described in Sec.III]

Representing each parameter with a 0 or 1 except ∇^y taken over the variable λ where there exist 4 relations,

A. $Tension\ \tau(\nabla^y)$ – This should be considered as the tension τ acting on ∇^y with y either 1 or -1 depending upon the orientation[as discussed in detail in Sec.III]. This tension would build up for open orbit when operator $\mathcal{O}$ won't commute because of the value of x as 3 or 4 for map φ^x [as described in Sec.II].
B. $Trajectory\ \iota^\lambda$ – This gives the value of the orbit γ in terms of the trajectory ι with the value as appeared in λ in ι^λ gives 1 for open orbit when operator $\mathcal{O}$ won't commute because of the value of x as 3 or 4 for map φ^x [as described in Sec.II] or gives 0 for closed orbit when operator $\mathcal{O}$ commute because of the value of x as 1 or 2 for map φ^x [as described in Sec.II]
C. $Loads\ /_{\ell^\lambda}$ – This provides the impact on the $gap\ \rho$ when the orbit is open for the load to exist as 1 representing the variable λ making it prominent for deformation to be discussed in [Point D] else its 0 as appeared in case of close orbit in $/_{\ell^\lambda}$ with / denotes the closure.

D. $Deformations\ \chi^{\lambda} -$ This relates [Point A, B, C] for the deformation in structure which is affected by the parameter χ with the deformation occurs only in case of open orbit for cumulative tension $\oint \tau(\nabla^{y})$ with this in effect only when λ in χ^{λ} takes up 1 else in case of close orbit the deformation won't exist for $\lambda = 0$ in χ^{λ}.

II. FORMULATIONS AND DEPENDABILITY

Considering a ring R of $k - parameterized$ where $k = \{1,2,3 \dots \dots n\}$ where each element denotes an orbit γ taking over the ring for an operator $\mathcal{O}$ to move from the ring R to the opposite of ring R^{op} to establish a factor ƒ which corresponds to the permutations upto $n - cycles$ for the n^{th} element in set k making $4 -$possible relations over a commutative $\mathcal{C}\ \exists c_{+}, c_{-}\ \in \mathcal{C}$ giving the 5^{th} relation by sufficing $4 -$relations to be considered below in stepwise formulations[Ref. 1].

Taking the ring R if it's established via a movement or rather a cyclic movement through an operator $\mathcal{O}$ from ring R to its opposite R^{op} then a chain-multiplier can be denoted for the action of the operator $\mathcal{O}$ to denote an orbit γ as stated in $3 - relations$ below,

$$\begin{cases} ring\ R \simeq \bigoplus^{k} \\ operator\ \mathcal{O} \longrightarrow R \rightarrow R^{op} \\ orbit\ \gamma \cong \prod k \end{cases}$$

Considering the affine parameter ∂ through ring $R = \oplus^{k}\ where\ \partial =\ \coprod_{\omega=\infty}(\eta^{0},\eta^{1})^{\omega}/\sim$ over a value of $\omega = \infty$ for an infinite hypercomplex manifold[For hypercomplex manifolds Ref. [2,3,4] gives a detailed account] present in topological space $\mathcal{J} -$ The suspension functor η over the set $\eta \in \eta^{0},\eta^{1}$ but to each one of them the operation is closed for the parameter ∂ and the reason for closing the operation is due to the control of suspension[Ref. 5] from affecting one genus and then spreading to other genera though when in each genus two operations are being carried out for both commutative and non-commutative forms over the same parameter $\mathcal{C}$ to be represented afterward for an infinite number of hypercomplex structures $\omega = \infty$, if one observes closely orbit $\gamma \in proper\ orbit, suspension\ orbit$ then the change in the geometry of the hypercomplex structures can only be effective iff the orbit moves from the domain to co-domain (here the ring R and opposite ring R^{op}) establishes 4 relations over map φ^{x},

$$\begin{cases} \varphi^{1} : R \longrightarrow \cdots \longrightarrow R & \Longrightarrow & no\ suspension\ as\ there\ is\ commutativity & \text{Boolean } False(\eta^{0}) \\ \varphi^{2} : R^{op} \longrightarrow \cdots \longrightarrow R^{op} & \Longrightarrow & no\ suspension\ as\ there\ is\ commutativity & \text{Boolean } False(\eta^{0}) \\ \varphi^{3} : R \longrightarrow \cdots \longrightarrow R^{op} & \Longrightarrow & suspension\ as\ there\ is\ non-commutativity & \text{Boolean } True(\eta^{1}) \\ \varphi^{4} : R^{op} \longrightarrow \cdots \longrightarrow R & \Longrightarrow & suspension\ as\ there\ is\ non-commutativity & \text{Boolean } True(\eta^{1}) \end{cases}$$

Establishing the orbit taken before $\gamma \cong \prod k$ where γ denotes the formulation,

$$\gamma = \sum_{x=1}^{4} \varphi^{x} \cong \prod k$$

III. STRUCTURING FACTOR WITH ITS INVERSE

Here I'll consider 2 specific factor where one is the inverse of the other in generating the n-cycle for consideration upon factor ƒ with it's inverse $ƒ^{-1}$ where the cycles are the orbits being represented over the integral,

$$\nabla^{1} = 2\pi i \oint_{\gamma} ƒ\ d\varphi^{x}$$

$$\nabla^{-1} = \frac{1}{2\pi i}\oint_{\gamma} ƒ^{-1}\ d\varphi^{x}$$

Now, as appeared in [Point A] in [Sec. I] the tension $\tau(\nabla^y)$ should be defined for y in ∇^y provided the representation map of φ^x either takes the value 1 or 2 / or 3 or 4 the trajectory ι^λ needs to be calculated which is the $n - trajectory$ for $cycle - n \begin{cases} \simeq R \\ \simeq R^{op} \end{cases}$ in either case through the movement from $1 - n$ or $1 - n$ in inverse cycles for factor $\mathfrak{f}$, $\mathfrak{f}^{-1} \supset \iota \; \forall \; \nabla^1, \nabla^{-1} \ni \nabla^y$ one can easily find $2 - orbits \begin{cases} open \\ close \end{cases}$ in the order $1 \longrightarrow 2 \longrightarrow 3 \ldots \longrightarrow n$ or $3 \longrightarrow 2 \longrightarrow 1 \ldots n$ for its inverse only and if only map φ^x for the value of $x \begin{cases} 1,2 \\ 3,4 \end{cases} \simeq \eta, \mathcal{C}$[C appearing below] denoting the relation,

$$\begin{cases} 1,2 \Longrightarrow closed \\ 3,4 \Longrightarrow open \\ \exists all\ exists\ in \begin{cases} R \longrightarrow R^{op} \\ R^{op} \longrightarrow R \end{cases} \forall\, n - elements\ of\ k\ in \bigoplus^k \end{cases}$$

Thus, the detailed cycles can be shown for the relation $k = \{1,2,3 \ldots \ldots n\}$ in ring $R = \oplus^k$ with opposite R^{op} suffice[Ref. 1],

$$\begin{cases} \nabla^1 \quad \Longrightarrow \quad \text{factor } \mathfrak{f} \quad = \begin{pmatrix} 1 & 2 & 3 & \ldots & n \\ 2 & 3 & 1 & \cdots & n \end{pmatrix} \text{ for cycle} - \quad n \simeq R \\ \nabla^{-1} \quad \Longrightarrow \quad \text{factor } \mathfrak{f}^{-1} \quad = \begin{pmatrix} 3 & 2 & 1 & \cdots & n \\ 2 & 1 & 3 & \cdots & n \end{pmatrix} \text{ for cycle} - \quad n \simeq R^{op} \end{cases}$$

Therefore to take into account [Point C and D] viz, loads $/_{\ell^\lambda}$ and deformations χ^λ for making a way to establish the non-trivial representation of $commutative\ /\ non - commutative\ parameter\ \mathcal{C} \in c_+, c_-$ such that $c_+ =$ factor $\mathfrak{f}$ and $c_- =$ factor $\mathfrak{f}^{-1}$ one gets a relation[Ref. 6,7],

$$\text{iff } c_+ \times c_- = c_+ \times c_- \Longrightarrow R \to R^{op} \to R \to R^{op} \xrightarrow{\sim} R \cong proper\ orbit\ \gamma$$

Else,

$$\text{iff } c_+ \times c_- \neq c_+ \times c_- \Longrightarrow R \to R^{op} \to R \to R^{op} \xrightarrow{\sim} R^{op} \cong suspension\ orbit\ \gamma$$

IV. SUSPENSIONS WITH BOOLEAN REPRESENTATION

As mentioned in [Results] at the first page in [Point 3] for a proper representation I'll consider a set of two hypercomplex structures as concerned for the alterations of the genera geometry. If two hypercomplex structures with $\wedge = 0$ or 1 in any values of genus g to consider $\mathcal{H}_g^{\wedge/}$ and $\mathcal{H}_g^{\wedge}$ in a set as described over the relation,

$$\star = \left(\mathcal{H}_g^{\wedge/}, \mathcal{H}_g^{\wedge}\right)$$

Then through proper attachment of $k - parameterized$ ring $\oplus^k$ $where\ \partial = \coprod_{\omega=\infty}(\eta^0,\eta^1)^\omega/\sim$ and as described over [Points 1,2,3 in Results] one gets an equivalence relation for the operation being stated there over another affine (σ, ϵ) where σ represents space needed for the operations and ϵ represents the elements associated with the operator σ thereby making a 2-tuple relation suffice,

$\epsilon \simeq \star$ for every ϵ operated under σ over the suspension functor $\mathbf{Sus}^{\Psi^x}(\sigma,\epsilon)^+ \; \exists x = 0$ or 1 representing (η^0,η^1)

Establishing,

$$\mathbf{Sus}^{\Psi^x}(\sigma,\epsilon) \simeq \mathcal{H}_g^{\wedge/} \coprod \mathcal{H}_g^{\wedge} = \mathcal{H}_4^{0/^*} \bigcup \mathcal{H}_2^{1^*} = \{(1,0),(2,0),(3,0),(4,0),(1,1),(2,1)\}$$

$\exists \mathcal{H}_4^{0/^*} = \{(1,0),(2,0),(3,0),(4,0)\}$ and $\mathcal{H}_2^{1^*} = \{(1,1),(2,1)\} \; \forall \coprod_{\omega=\infty}(\eta^0,\eta^1)^\omega/\sim$ with the annihilator $\mathcal{A}$ representing globally non-commutativity for factors $\mathfrak{f}, \mathfrak{f}^{-1}$ in matrix multiplications

Therefore, considering a chain of flow or orbits for (a trivial example to denote) if $\mathcal{H}_g^{\wedge/}$ initiates the orbit $\gamma \cong \prod k$ in R and goes through R^{op} with a reverse flow from R^{op} to R this will deduce the open or closed (where open means the break in continuous flow) representing the 4-tuple relation $\left(\tau(\nabla^y), \iota^\lambda, /_{\ell^\lambda}, \chi^\lambda\right)$ where all the 4-parameters would establish the required relation that I'll explain if and only if this 4-tuple relation holds true for the relation of $\mathbf{Sus}^{\Psi^x}(\sigma,\epsilon)^{+}$ via the same suspension functor $\eta \in \eta^0, \eta^1$ such that in the case $\sigma \Longrightarrow \left(\tau(\nabla^y), \iota^\lambda, /_{\ell^\lambda}, \chi^\lambda\right)$ one can establish a Boolean $True(\eta^1)$ or $False(\eta^0)$ if[Ref. 1,5 8-10],

$$\eta \begin{cases} proper\ orbit\ \gamma \xrightarrow{ends\ up\ to} suspension\ orbit\ \gamma \\ suspension\ orbit\ \gamma \xrightarrow{ends\ up\ to} proper\ orbit\ \gamma \\ \qquad\qquad\qquad \mid establishes\ \ \eta^1 \\ proper\ orbit\ \gamma \xrightarrow{ends\ up\ to} proper\ orbit\ \gamma \\ suspension\ orbit\ \gamma \xrightarrow{ends\ up\ to} suspension\ orbit\ \gamma \\ \qquad\qquad\qquad \mid establishes\ \eta^0 \end{cases} \qquad eq.(A)$$

Over a consideration,

$$\text{For } \mathbf{Sus}^{\Psi^x}(\sigma,\epsilon)^{+} \begin{cases} \epsilon \simeq \star \text{ for every } \epsilon \text{ operated under } \sigma \text{ over the suspension functor } \mathbf{Sus}^{\Psi^x}(\sigma,\epsilon)^{+} \\ \sigma \Longrightarrow \left(\tau(\nabla^y), \iota^\lambda, /_{\ell^\lambda}, \chi^\lambda\right) \\ \text{for } \Psi^x, x \text{ takes the value 0 or 1 establishes } eq.(A) \\ \\ \text{above three relation suffice}_{\Downarrow} \\ \text{Global non} - \text{commutativity for annihilator } \mathcal{A} \end{cases}$$

Explained as,

Trajectory ι^λ is defined in terms of orbit γ where the orbit denotes a continuous flow from $R \longrightarrow R^{op} \longrightarrow R$ ... and if this flow continues over a period without any break that is a closed orbit then the value of λ in ι^λ won't break and thus having a value of 1 for open orbit when the trajectory breaks and thereby induces a tension $\tau(\nabla^y)$ with y being a trivial parameter for the orientation if the orbit starts from R or takes the start from R^{op} where if the orbit is closed then this can be taken as a smooth flows over the hypercomplex structures which would regularize the structure been compact topological space but if the orbit is open which means the trajectory is not closed then the point where the orbit discontinues induces a tension from both ends of the discontinued fibers that is justifying the flow from a movement of a ring to opposite ring and so on… The induced tension by the break of the fiber would create a suspension over the hypercomplex structure where that suspension can create a genus for the periodic discontinuation of the flows if and only if there exists non-commutativity in the open orbits when the tension will impart a load $/_{\ell^\lambda}$ where $\lambda = 0$ appears in case of close orbit but for the open orbit with $\lambda = 1$ the number of genus would depend upon the strength of the gap between two ends of the broken fibers where the gap would make a proportionality relation and inverse proportionality relation through,

$$\text{strength of } gap\ \rho \propto \text{number of } genus$$

$$\text{weakness of } gap\ \rho\ 1/\!\propto \text{number of } genus$$

Therefore, this will depend upon the deformation χ^λ for the value of $\lambda = 1$ in case of open orbit thus making the suspension for the concerned functor $\mathbf{Sus}^{\Psi^1}(\sigma,\epsilon)$ where for each deformation or suspension or even the regularization or the eraser of the suspension provided there exists commutativity for value 0 and non-commutativity for value 1 only iff for the infinite hypercomplex manifolds and not the two hypercomplex manifolds that I grouped to established the suspension there is non-commutativity and no commutativity would be structured over the Topological space $\mathcal{J}$ when there arrives the annihilator $\mathcal{A}$.

Thus, the annihilator $\mathcal{A}$ can only be established if η^0, η^1 be active elements (whereby active means that both the relation needs to suffice) for suspension η one gets the desired relation,

$$for\ both\ \eta^1, \eta^0\ following\ eq.(A) \begin{cases} \begin{pmatrix} \mathfrak{f} & \mathfrak{f}^{-1} \\ \mathfrak{f}^{-1} & \mathfrak{f} \end{pmatrix} taken\ as\ \alpha \\ \\ \begin{pmatrix} \mathfrak{f} & \mathfrak{f} \\ \mathfrak{f}^{-1} & \mathfrak{f}^{-1} \end{pmatrix} taken\ as\ \beta \end{cases} \Longrightarrow \alpha \times \beta \neq \beta \times \alpha\ implies\ non-commutativity$$

+This suspension functor $\mathbf{Sus}^{\Psi^x}$ is first introduced in the Preprint https://doi.org/10.21203/rs.3.rs-1798323/v1

V. COBORDISM WITH RING HOMEOMORPHISM FOR POTENTIAL ρ_ϕ

For the Topological space $\mathcal{J}$, assuming it to be compact having $d-$ dimensions then for the potential ρ_ϕ taken over the previously described two hypercomplex manifolds (I'll drop here all the indices to simply the notations) $\mathcal{H}$ and $\mathcal{H}'$ having $(d-1)-$ dimensions then for the associated structure $\mathcal{S} \ni \mathcal{J}$; cobordism can be justified over 3-relations,

$$\begin{cases} \rho_\phi = \mathcal{H} \coprod \mathcal{H}' \\ \partial \mathcal{S} = \rho_\phi \\ cobordism\ satisfies\ through\ \partial \mathcal{S} \end{cases}$$

Such that for $\partial \mathcal{S}$ two cases of dimensions are categorized as described above; $\mathcal{H}$ and $\mathcal{H}'$ having $(d-1)-$ dimensions with $\mathcal{S}$ of $d-$ dimensions there exists a ring homeomorphism for function $f: R \longrightarrow R^{op}$ for the potential ρ_ϕ where the non-commutativity for the factors $\mathfrak{f}\ and\ \mathfrak{f}^{-1}$ if one takes two elements ϕ and ϕ^0 in ring R then that non-commutativity will give two relations which can suffice the polynomials in formal power series denoting rational numbers $\mathbb{Q}$ in the $4k$ cohomology group then for that potential ρ_ϕ the rational coefficients can be defined for the vector bundles $\mathcal{F}$ over $\mathcal{J}$ defined through rational $\mathbb{Q}$ and potential ρ_ϕ through,

$$\begin{cases} \rho_{\phi_{(k)}}(\mathcal{F}, \mathbb{Q}) \\ H^{4k}(\mathcal{J}, \mathbb{Q}) \end{cases}$$

Where for genus g on $\mathcal{H}$ and $\mathcal{H}'$ is defined for manifold $\mathcal{S} \ni \mathcal{J}$ where cobordism is satisfied through $\partial \mathcal{S}$ over the relation,

$$\mathcal{S} \subseteq \mathcal{J} \text{ for } \rho_\phi \ \exists g\left(\mathcal{H} \coprod \mathcal{H}'\right) = g(\mathcal{H}) + g(\mathcal{H}')$$

Therefore for the Boolean $(0,1)$ there is a prominently identifiable η^0, η^1 suspension-category for a constant $\complement$ and a parameter φ sufficing non-commutativity in global scenario for $\omega = \infty$ in $\coprod_{\omega=\infty}(\eta^0, \eta^1)^\omega/\sim$ where ring homeomorphism is satisfied for the value of the potential $\rho_\phi = 1$ with the above mentioned relation $\mathcal{S} \subseteq \mathcal{J}$ satisfying cobordism through $\mathcal{X}(\mathcal{S})$ iff $\complement, \varphi \ni R^{op}$ then,

$$\eta^1 \Longrightarrow \complement = \varphi = 1\ and\ \eta^0 = \begin{cases} \varphi^2 \neq \complement \\ \complement \neq 0 \end{cases}$$

Thus the global structure can be defined over the parameter ω over the topological space $\mathcal{S} \subseteq \mathcal{J}$ via the coefficient $\mathcal{X}$ established over ρ_ϕ in the relation,

$$\mathcal{X}_{\rho_\phi}(\mathcal{S}) = \int_{\mathcal{S}} \prod_{\omega=2}^{\infty} \eta$$

VI. DISCUSSIONS

Higher dimensional generalization has been made by extending the Preprint https://doi.org/10.21203/rs.3.rs-1798323/v1 where any generalization or smoothness of the genus or the induced suspension in the compact topological space has been established through the two-grouping hypercomplex for open and closed orbit all though the 4-tuple relation being considered upon. However, for the global scenario there will be no commutativity for the two hypercomplex grouping; there will be non-commutativity and this has been topologically marked via cobordism and ring homeomorphism provided there exist a peculiar potential ρ_ϕ that ultimately suffice the Boolean for the concerned suspension category in rotations and inverse rotations through the complex planes where the genera are rational numbers $\mathbb{Q}$ in the $4k$ cohomology group.

The k appearing in $4k$ cohomology group and in ring $R = \oplus^k\ where\ \partial = \coprod_{\omega=\infty}(\eta^0, \eta^1)^\omega/\sim$ are completely different although the notation appers to be the same.

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