Upscaling Dragon ball on Reddit

So yeah lately I have been seeing a lot of Goku Downplay, on the internet, Besides Youtube, Tiktok , and Instagram. Yes I am talking about reddit. People on reddit seem to have a quite a misunderstanding about the cosmology of Dragon ball, and have literally no idea where it scales , in comparison to the well known tiering system and Fictional Verses. So I have decided to clear this misunderstanding and ignorance , regarding Dragon balls scaling for the Good.

We will be starting first , with a relatively smaller scale, in comparison to the other ones I have . By the word "Smaller " , I am referring to a scale which would upscale Goku to the start of the High tiers , within the well known tiering systems... It was better to start with lower tiers within tiering system than the higher ones , so that i can avoid being called a goon .

There are a few topics , that I wouldn't be covering here , such as Canonicity of Guidebooks, Canonicity of Anime, Reliablity of the DB staff, etc . Since I am assuming most of the Powerscalers and fans out there are already are of such stuff beforehand and the answers to questions associated with such topics. Even after all this , if someone does have any questions , regarding the above things they will be free to ask me on discord.

So keeping all of these things aside , we shall be getting started with our scale.

The scale is basically divided into Three parts.

1. **INTRODUCTION**
2. **SCALING THE COSMOLOGY**
3. **CONCLUSION.**

So let's get started with our first half of the scale . That is the introduction half , which will help you to understand , what we are we going to use in this scale, why those things can be used and what importance do they have.

INTRODUCTION

So we will get started with the first half of your scale. In This scaling document we will basically be scaling the LIVING WORLD of Dragon ball. And to be more precise, we will be scaling only a specific structure within it. Since we are confident that, scaling this specific structure would be enough. Yes I am talking about the Superspace within the Living world. Now lot of questions would have risen in the minds of the readers . We will cover them one by one

1. PROOF FOR EXISTENCE OF SUPER SPACE AND SUPER SYMMETRY

Let's see the evidence for this.

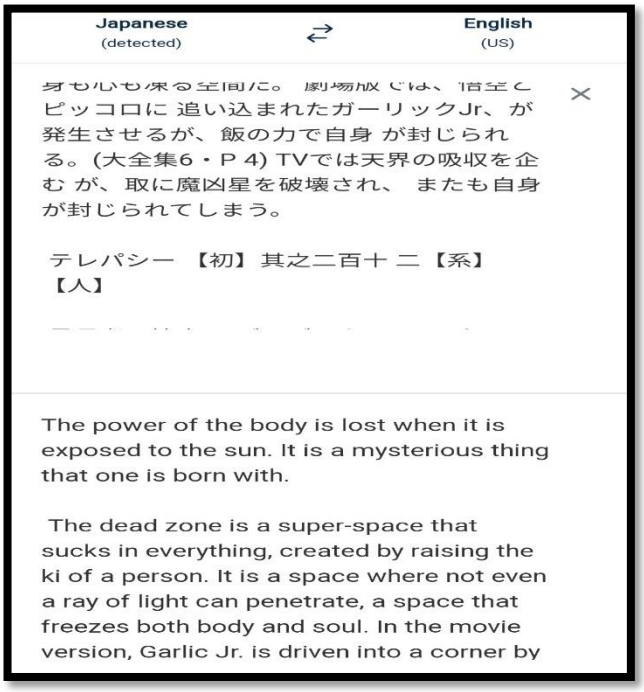

れて力が抜けてしまう。生まれながらにして持つ不思議な力。

デッドゾーン☆【系】能力【人】ガーリックJr.【特】気を高めて作りあげる、すべてを吸い込む超空間。一条の光もささない、身も心も凍る空間だ。劇場版では、悟空とピッコロに追い込まれたガーリックJr.が発生させるが、悟飯の力で自身が封じられる。(大全集6・P44)TVでは天界の吸収を企むが、悟飯に魔凶星を破壊され、またも自身が封じられてしまう。

デッドゾーン

テレパシー【初】其之二百十二【系】能力【人】界王、神、最長老、孫悟空、デンデ、ネイル、ピッコロ【特】ほとんどが種族がもつ天性の特殊な能力。相手の脳に直接語りかけ、声を出さなくても会話することができる。界王の場合、自分がアンテナ代わりとなることで、能力を持たない者同士での会話も可能にする。ナメック星人の場合、同種族間なら誰とでも会話できる。また悟空は悟飯にしか聞こえないメッセージをあの世から

TRANSLATION FOR THE ABOVE TEXT :-

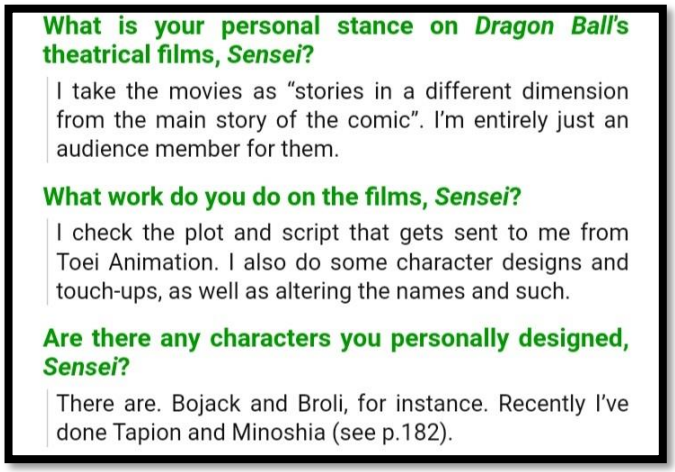


Source for the above scan :- Daizenshu 6, pg 44 .

The above scan is about the infamous Dead Zone, created by Garlic Junior, the main Antagonist of the Movie , Dragon ball Z : Dead Zone. The Dead zone Is called using the kanji Cho Kukan , which Translates to superspace, as the above Translation shows. . We will be using this superspace, and scale Goku to our desired TIER , as we feel like.

But the main question, that arises in everyone's mind is: " BUT MOVIES ARE NON CANON , ANYTHING MENTIONED IN THE MOVIE DOES NOT APPLY TO MAIN CONTINUITY, SO DEAD ZONE IS USELESS ".

Now to understand and answer , Let's go Over what Toriyama Says about Movies.



What is your personal stance on *Dragon Ball*'s theatrical films, *Sensei*?

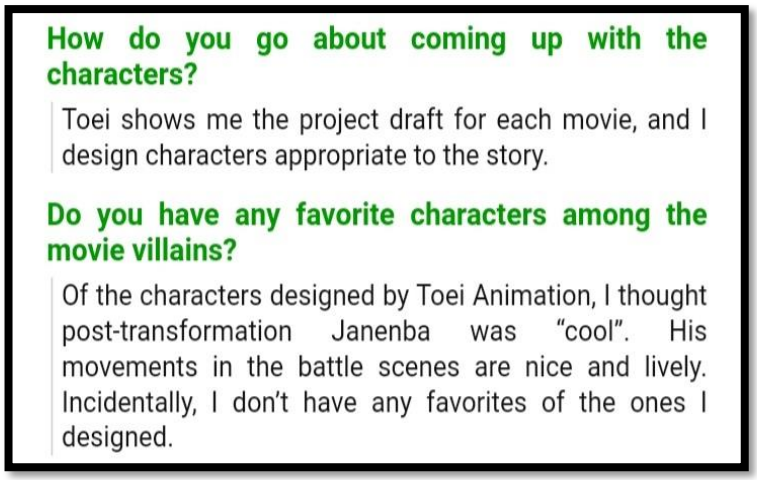
I take the movies as "stories in a different dimension from the main story of the comic". I'm entirely just an audience member for them.

What work do you do on the films, *Sensei*?

I check the plot and script that gets sent to me from Toei Animation. I also do some character designs and touch-ups, as well as altering the names and such.

Are there any characters you personally designed, *Sensei*?

There are. Bojack and Broli, for instance. Recently I've done Tapion and Minoshia (see p.182).



How do you go about coming up with the characters?

Toei shows me the project draft for each movie, and I design characters appropriate to the story.

Do you have any favorite characters among the movie villains?

Of the characters designed by Toei Animation, I thought post-transformation Janenba was "cool". His movements in the battle scenes are nice and lively. Incidentally, I don't have any favorites of the ones I designed.

The above scans Make it clear that the Dragon ball movies are basically DIFFERENT STORIES / NARRATIVES happening in Parallel Worlds or Dimensions , which resemble the main cosmology of DBS continuity. A perfect example of this will be the Future Trunks arc , within Dragon ball super, which in itself is basically a story happening in a Parallel world , completely separated from the Main Continuity. It is self Evident that the Cosmology of the Future Trunks Timeline was same as the Main DBS timeline where our characters live.

The creation of movies is supervised by Toriyama Himself and he is responsible for approving the scripts , the plot, the design, the characters, and often tales the mantle of designing the characters himself. Now this already males tye

movies as CANON , to per say , since a Fictional work related to a Franchise whose plot and creation is entirely supervised by the author himself should be Immediately Canon to the Franchise. So this makes the Movies CANON to the Dragon ball Franchise. But they are Just Different Parallel worlds Different from the Main Continuity of the anime and Manga. Even Anime and Manga are considered as separate Continuities by Akira Toriyama, but they share their similarities.

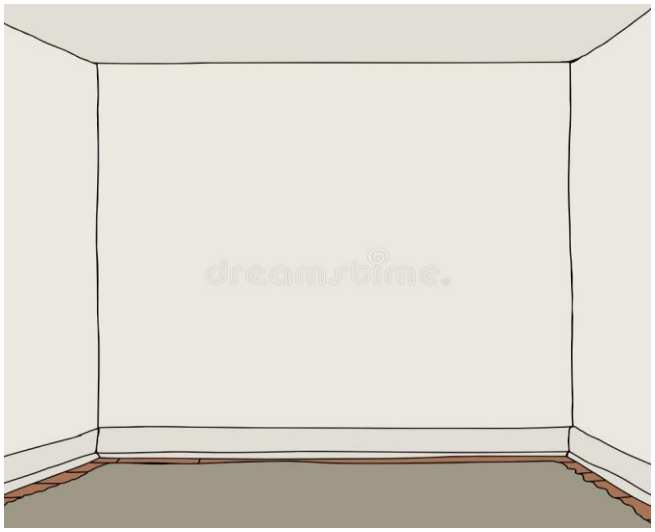
Now the question that arises in people's mind is " how does this effect anything?? How does it matter whether they are canon or not , they are still not a part of the Main Continuity of DBS , hence the movies cannot be used for Scaling the cosmology of Main Continuity" . However these statements are only partly correct and partly wrong.

Yes it's obvious that the Different Parallel worlds share Different narratives and plot lines , with somewhat Different characters, fights and events which might not exist in the main Continuity of the Anime. This shows us that we cannot use the feats of A CHARACTER LET'S SAY GOKU, from a movie and say that it applies to the current Timeline Goku. But the real deal lies with the cosmology and how we interpret it's statements

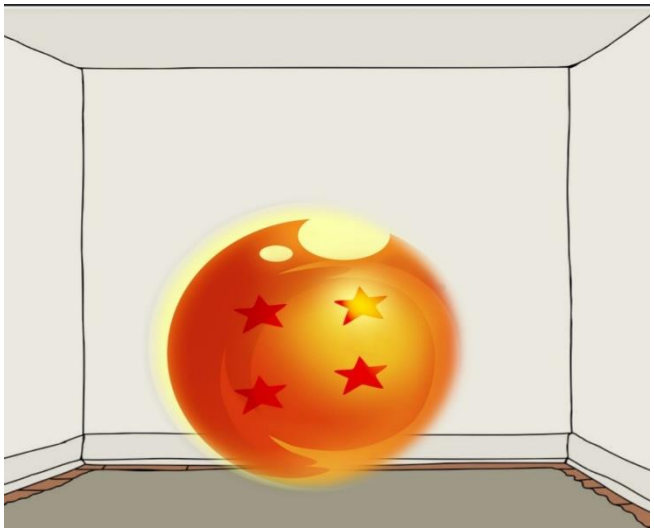
Since we will be scaling the Dead Zone made by Garlic Junior in this scale we will Try to understand this by using the Example from the Movie and how the superspace from the Movie actually helps us to upscale the Cosmology of the Main Continuity.

Let's try to understand this using an example , that will help you guys to get your mind around what I am going to explain in simpler terms.

Although the entire explanation is based on the presupposition that Dragon ball Follows Many World's Interpretation. If any doubts this proposition and want evidence, I will be providing the link for the DB official website , which has confirmed the existence of MWI in Dragon ball. And some additional Evidence from guidebooks, anime and Manga would be available on my discord , whenever you fell free to DM me



1.Lw Main continuity.



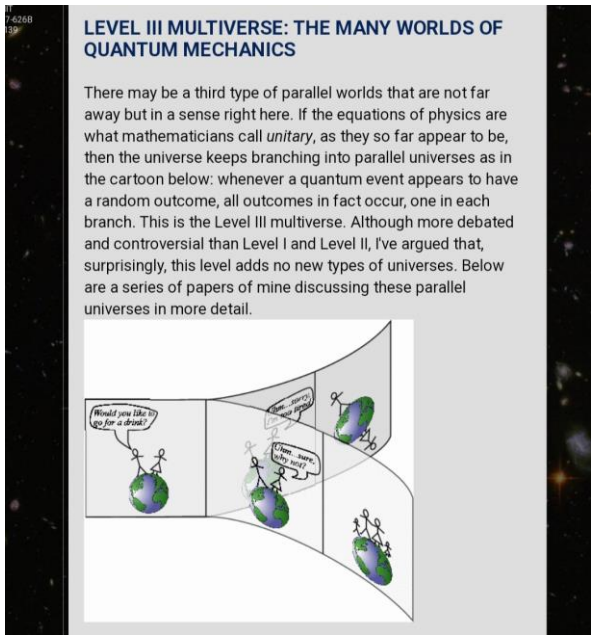
2.Lw Dead Zone Movie timeline

So considering that both the Main Continuity and the Dead Zone Movie timeline are different Parallel worlds, we have constructed the Following example.

Let the Room be the Living world from Both the timelines , and the Dragon ball Represent the Super space (aka the Dead Zone). Now there is one important characteristics of the Parallel worlds created in Many worlds Interpretation. It is that every Parallel world shares tye dame Fundamental laws of Physics and nature , and similar Ontological properties on a fundamental level.

Hugh Everett III's many-worlds interpretation (MWI) is one of several mainstream interpretations of quantum mechanics.

In brief, one aspect of quantum mechanics is that certain observations cannot be predicted absolutely. Instead, there is a range of possible observations, each with a different probability. According to the MWI, each of these possible observations corresponds to a different universe, with some or many of the interpretation's proponents suggesting that these universes are as real as ours. Suppose a six-sided die is thrown and that the result of the throw corresponds to quantum mechanics observable. All six possible ways the die can fall correspond to six different universes. In the case of the Schrödinger's cat thought experiment, both outcomes would be "real" in at least one "world".



Which means that if , general relativity is true and exists in one Parallel world it will exist across all Parallel worlds.

The above two scans provided tell us how each Parallel universe in Many Worlds Interpretation, is " as Real as our own" , and doesn't contain any new type of universes (unlike Type 2) , which means all these Parallel worlds are similar on a fundamental level in context to the Laws of Physics and Nature. Which means they Share similar Ontological properties , and shares similar extent of Nomo logical possibilities .

- **Nomological possibility** is *possibility under the actual laws of nature*. Most philosophers since David Hume have held that the laws of nature are *metaphysically contingent*—that there could have been different natural laws than the ones that actually obtain. If so, then it would not be *logically* or *metaphysically* impossible, for example, for you to travel to Alpha Centauri in one day; it would just have to be the case that you could travel faster than the speed of light. But of course there is an important sense in which this is *not* possible; *given* that the laws of nature are what they are, there is no way that you could do it. (Some philosophers, such as Sydney Shoemaker [*citation needed*], have argued that the laws of nature are in fact *necessary*, not contingent; if so, then nomological possibility is equivalent to metaphysical possibility.)

In metaphysics, **ontology** is the philosophical study of being. It investigates what types of entities exist, how they are grouped into categories, and how they are related to one another on the most fundamental level (and whether there even is a fundamental level).[1] Ontologists often try to determine what the categories or highest kinds are and how they form a system of categories that encompasses the classification of all entities. Commonly proposed categories include substances, properties, relations, states of affairs, and events. These categories are characterized by fundamental ontological concepts, including particularity and universality, abstractness and concreteness, or possibility and necessity. Of special interest is the concept of ontological dependence, which determines whether the entities of a category exist on the most fundamental level. Disagreements within ontology are often about whether entities belonging to a certain category exist and, if so, how they are related to other entities.[2]

When we say similar ONTOLOGICAL PROPERTIES we mean that any two Parallel Worlds are Equally Real and are same in context to properties , Nature of existence , the Nature of being and what defines them, and what they can encompass . If I say that one of the Timelines can encompass an Infinite Galaxy , then it would be possible for any other Parallel world to also encompass an Infinite Galaxy as well, since both of them have similar Ontological properties.

Now let's get to our example about rooms to understand this more clearly in context to the scale. So we have the Dead Zone Timeline (let's call it D) and main timeline (Let's call it M) , having Similar Ontological properties due to them being Parallel worlds.

Now we No that Timeline D encompasses a Super space in it. This can only be possible if said Timeline , has the required Fundamental laws of Physics and nature , which allow for the existence of super space . In this case the theoretical concept will be Supersymmetry. So The existence of superspace is a Nomological possibility which is true and the required Necessity for this possibility to be true, which in this case is " The existence of the notion of Supersymmtery on a fundamental level " . So we can Conclude that the Supersymmtery exists Ontologically within the Reality of Timeline D, since without supersymmetry, existence of superspace is impossible.

Now we do know that Timeline M, is Ontologically similar to Timeline D, which means that the Fundamental notion of supersymmetry will also be Ontologically Existent within (the main Timeline) due to both of them being Parallel worlds. This helps us to deduce that, the required Necessity for the existence of superspace in Timeline M has been fulfilled. Which means that the Existence of superspace is Nomologically possible , within the Main Continuity since both the TIMELINES D & M , are Ontologically similar and have similar fundamental laws of Physics which would include Supersymmtery, which just proves that is possible for the Living world of both the Timelines to encompass a superspace.

Now let's see the room example above, you can see an Empty room(Room 1) and room containing a Dragon ball (Room 2)

Let The Dragon ball be the equivalent of superspace and The Room be the Equivalent of The Living world.

Both Room 1 and Room 2 are equal in size , volume, Physical nature Dimensionality, Laws of world and physics. Which means both the rooms are Ontologically similar. Thus if a An Object of a specific volume cam exist within Room 2 , then it will be possible for it to be able to exist in Room 1 as well since Room 1 has the required amount of size and volume, to allow for the existence of An Object (The Dragon ball) to be Nomologically possible.

Now the same thing applies to the Dead Zone ,. Let's say that the Dead Zone Is an Infinite Dimensional construct (for now, we shall prove it later). Room 2 is clearly shown to be able to encompass this Dead Zone , which means it has

required level of Dimensionality, which can allow the existence and encompassing of an Infinite Dimensional Construct. This means that The Dimensionality of Room 2 should be atleast greater than or equal to Infinite D .

Now Room 1 Clearly has Similar Volume as Room 2 (although it is empty , the emptiness denotes the absence of the superspace within the Main Continuity) . By visualizing the above Image we can Conclude that Room 1 clearly has the required amount of Volume to encompass the superspace, even though it actually is absent from Room 1. Which means It is Nomologically possible for room 1 to encompass am Infinite Dimensional Structure, which can only happen if Room 1 Also has a Dimensionality greater than equal to The Dead Zone it is supposed to encompass.

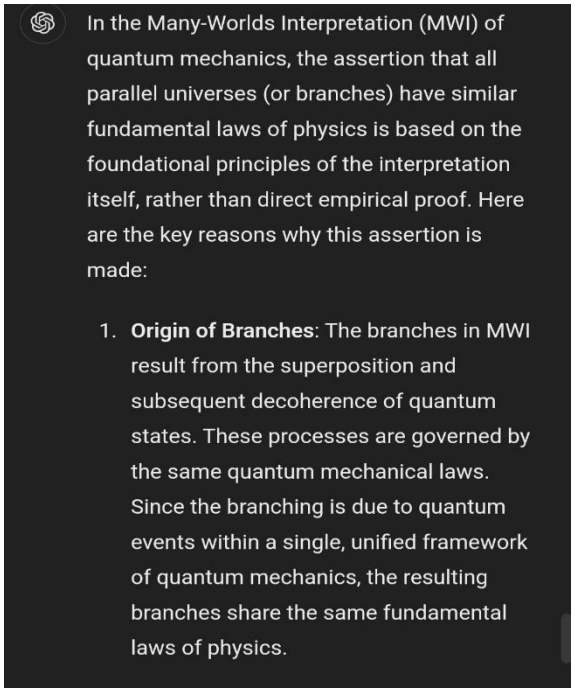
The absence of the Dragon ball , has LITERALLY NO EFFECT on the Dimensionality and the Volume of Room 1 or Room 2 , since their Dimensionalities are their Fundamental properties which are similar to each other. Similarly the absence of superspace or the Dead zone has no effect on the Capability of the Living world to encompass an Infinite Dimensional Super symmetric structure. Since to be able To encompass is a integral part of it is Ontological Properties and it meets all the required Necessities as similar to the Timeline which encompasses it. Just like how the absence of air from a gas cylinder has no effect on the Volume of the container . The Container will still have the required volume to encompass said Air.

Thus we can Conclude the if we scale the superspace from the Dead Zone timeline to Infinite dimensional, it will not only upscale the Living world of the Dead Zone Timeline , but also the Living world of the Main Timeline , since The Main Timeline will have same Ontological properties and Dimensionality as the Timeline of Dead Zone Movie due to both being Parallel worlds

This Concludes our Introduction , to our scale . Now we Will be moving onto scaling the Dead Zone, and how it scales to Infinite Dimensional or Higher.

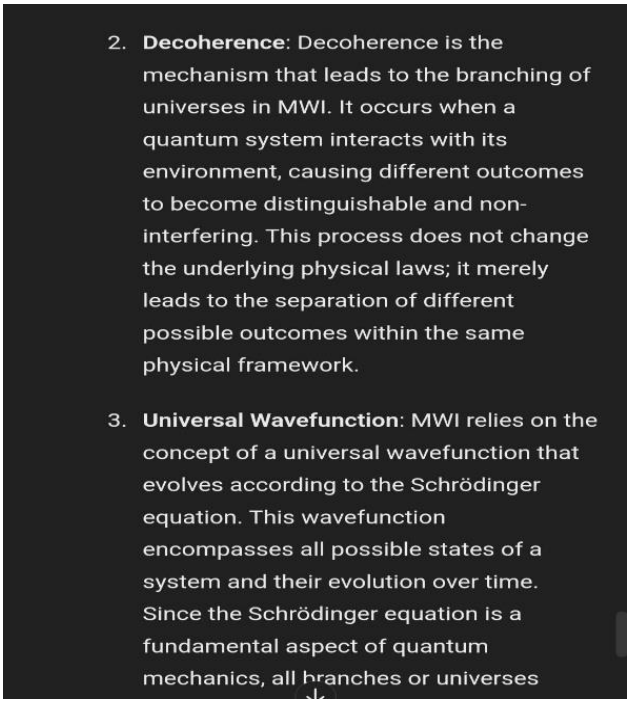
But since some people might bring whatsoever that " Bro but you didn't elaborate on how they can Have similar Ontological Properties and Laws of Nature . Those scans are not enough bro , Provide reasoning bro ".

Since I am way too lazy to type the reasoning here. I will just provide a few pics from ChatGPT , explaining why it is case , and if you guys believe chatgpt is wrong in its reasoning you can try to debunk It or ask me later on



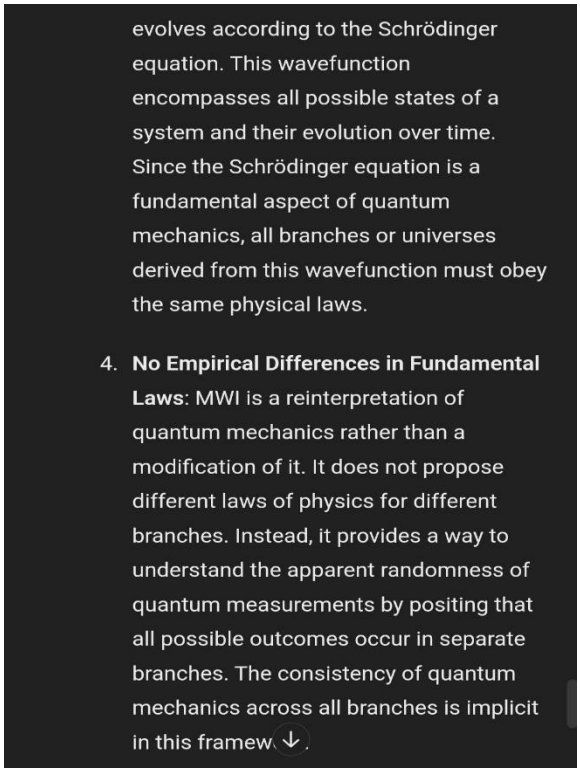
In the Many-Worlds Interpretation (MWI) of quantum mechanics, the assertion that all parallel universes (or branches) have similar fundamental laws of physics is based on the foundational principles of the interpretation itself, rather than direct empirical proof. Here are the key reasons why this assertion is made:

1. **Origin of Branches**: The branches in MWI result from the superposition and subsequent decoherence of quantum states. These processes are governed by the same quantum mechanical laws. Since the branching is due to quantum events within a single, unified framework of quantum mechanics, the resulting branches share the same fundamental laws of physics.



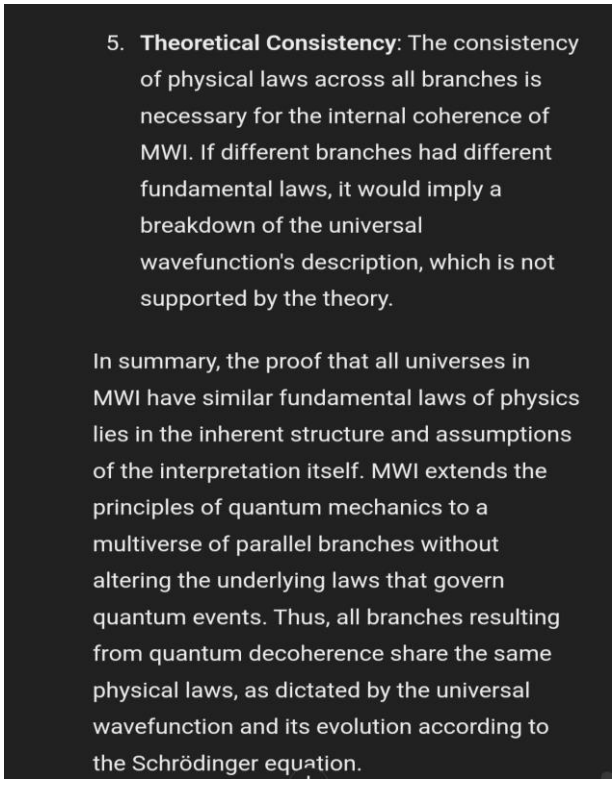
2. **Decoherence**: Decoherence is the mechanism that leads to the branching of universes in MWI. It occurs when a quantum system interacts with its environment, causing different outcomes to become distinguishable and non-interfering. This process does not change the underlying physical laws; it merely leads to the separation of different possible outcomes within the same physical framework.

3. **Universal Wavefunction**: MWI relies on the concept of a universal wavefunction that evolves according to the Schrödinger equation. This wavefunction encompasses all possible states of a system and their evolution over time. Since the Schrödinger equation is a fundamental aspect of quantum mechanics, all branches or universes



evolves according to the Schrödinger equation. This wavefunction encompasses all possible states of a system and their evolution over time. Since the Schrödinger equation is a fundamental aspect of quantum mechanics, all branches or universes derived from this wavefunction must obey the same physical laws.

4. **No Empirical Differences in Fundamental Laws**: MWI is a reinterpretation of quantum mechanics rather than a modification of it. It does not propose different laws of physics for different branches. Instead, it provides a way to understand the apparent randomness of quantum measurements by positing that all possible outcomes occur in separate branches. The consistency of quantum mechanics across all branches is implicit in this framew



5. **Theoretical Consistency**: The consistency of physical laws across all branches is necessary for the internal coherence of MWI. If different branches had different fundamental laws, it would imply a breakdown of the universal wavefunction's description, which is not supported by the theory.

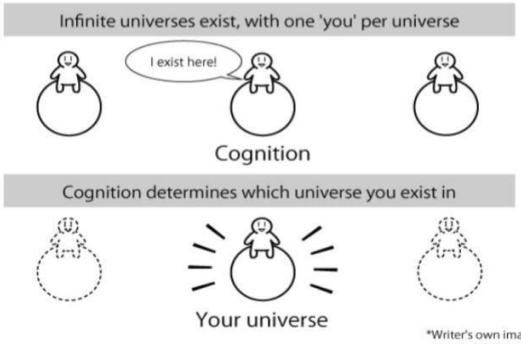
In summary, the proof that all universes in MWI have similar fundamental laws of physics lies in the inherent structure and assumptions of the interpretation itself. MWI extends the principles of quantum mechanics to a multiverse of parallel branches without altering the underlying laws that govern quantum events. Thus, all branches resulting from quantum decoherence share the same physical laws, as dictated by the universal wavefunction and its evolution according to the Schrödinger equation.

SCALING DEAD ZONE BY GARLIC JUNIOR.

So yes now we will be going over the scaling of the dead Zone, and try finding out where it actually scales to. We have already come to conclusion that Dead Zone Is a super space and for a super space to exist , the verse should have supersymmetry as Ontologically Existent within the verse to make a superspace a Nomological possibility. But before we start with the scaling it is better to go Over a few small things

EVIDENCE FOR THE EXISTENCE OF QUANTUM MECHANICS

Simply by cognizing, "I'm here", the universe around you manifests. This is what's known as **the many-worlds interpretation.**



*Writer's own image

Parallel Worlds and Time Paradoxes

Now that we've all hopefully got at least a vague understanding of how time machines could work, I decided to ask about parallel worlds and time paradoxes. Time paradoxes occur when some kind of contradiction or loop is created due to your travels to and from the past and future, and in order to enable time travel, we'd have to find a way to resolve them. Even within Dragon Ball, Trunks altered his universe's history slightly by going back to the past to discover the Androids' weakness. It's this process that gives rise to multiple futures, i.e., parallel worlds.

——So in Dragon Ball, the future where the Androids run rampant and the one where they're defeated are actually completely separate universes?

Prof. Futamase: That's right. If you successfully travelled to the past then attempted to return back to the point in time you started from, the universe you arrive to would not be your original one, but a parallel world where you had travelled to the past. You'd essentially be in a new universe with a different history.



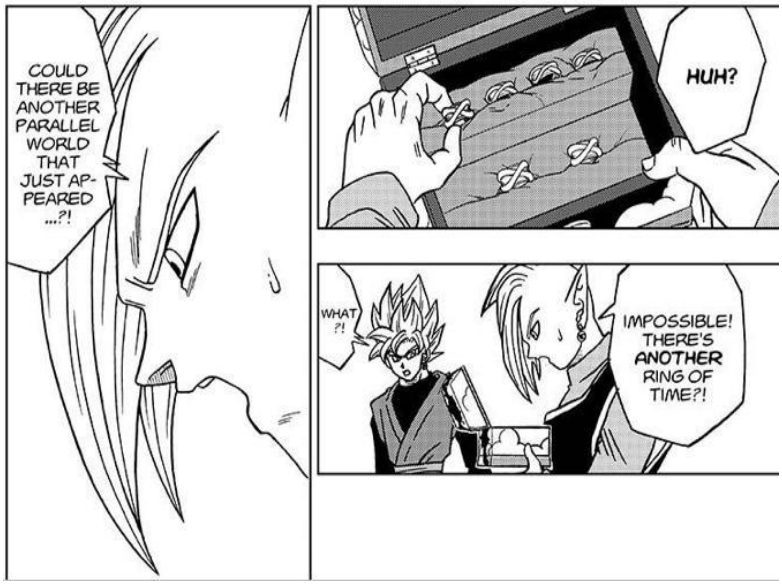




see what the effects are. They can create an infinite variety of possible alternate pasts and not affect their "present" at all. Interestingly, it appears that characters can then travel to any point in that alternate history, possibly even right up to the alternate "present" or even into an alternate future. Who knows?

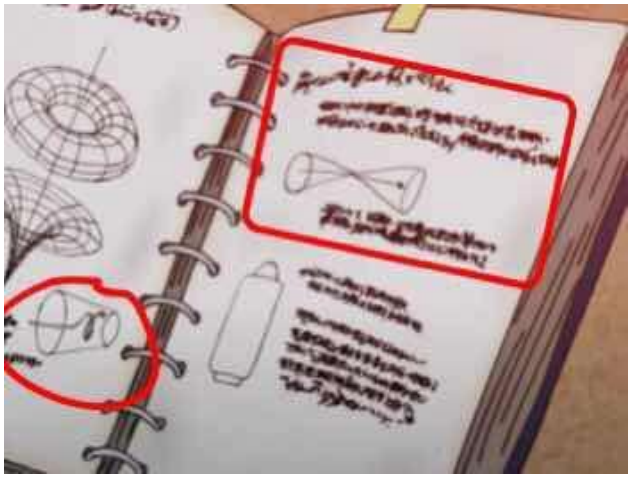
We know Trunks did it. He goes back in time 20 years changes the past so that all the Z-Warriors are prepared for the Androids. Then he returns to his future, where nothing has changed, mind you, to recharge his time capsule. Then he travels 17 years back into that alternate past. Not 17 years back into his own history where none of the Z-Warriors know the Androids are coming, but 17 years back into the CHANGED history. Couldn't he have, by extension, traveled back only 1 year into the changed history? Couldn't he have traveled back only 1 week or 1 day into the alternate history?

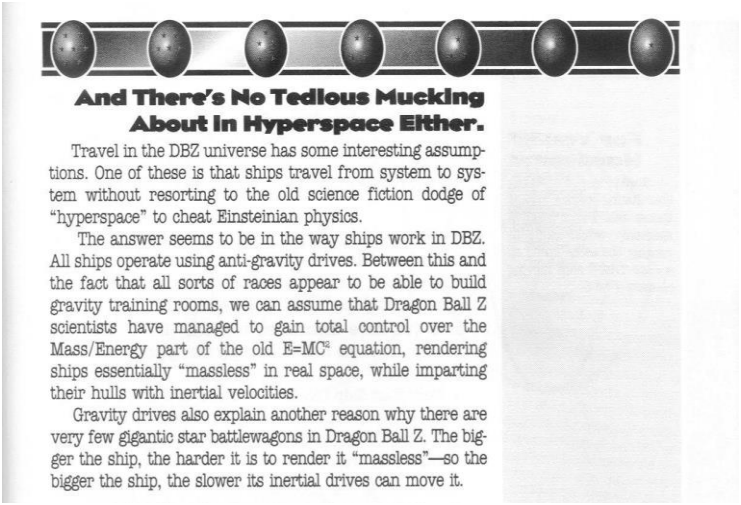






EVIDENCE FOR THE EXISTENCE OF EINSTEINIAN PHYSICS .





And There's No Tedious Mucking About in Hyperspace Either.

Travel in the DBZ universe has some interesting assumptions. One of these is that ships travel from system to system without resorting to the old science fiction dodge of "hyperspace" to cheat Einsteinian physics.

The answer seems to be in the way ships work in DBZ. All ships operate using anti-gravity drives. Between this and the fact that all sorts of races appear to be able to build gravity training rooms, we can assume that Dragon Ball Z scientists have managed to gain total control over the Mass/Energy part of the old $E=MC^2$ equation, rendering ships essentially "massless" in real space, while imparting their hulls with inertial velocities.

Gravity drives also explain another reason why there are very few gigantic star battlewagons in Dragon Ball Z. The bigger the ship, the harder it is to render it "massless"—so the bigger the ship, the slower its inertial drives can move it.

The above scans posted by me are more than enough to prove the existence of Einsteinian Physics, and Quantum Mechanics existing on a fundamental level within the Cosmos. As a result the Cosmological structures including the pace time fabric of reality follows the laws and principles of Einsteinian Physics and Quantum Mechanics.

Now we will be going over the scaling of Superspace and understand how the Ontological existence of the three important Theories :- Quantum Mechanics, Einsteinian Physics and Supersymmetry, helps us to derive an Infinite dimensional superspace

UNDERSTANDING HOW AND WHERE IT SCALES.

So superspace is basically the coordinate space of a theory exhibiting supersymmetry. In such a formulation, along with ordinary space dimensions x, y, z, ..., there are also "anticommuting" dimensions whose coordinates are labeled in Grassmann numbers rather than real numbers. The ordinary space dimensions correspond to bosonic degrees of freedom, the anticommuting dimensions to fermionic degrees of freedom.

There are several factors that effect the Dimensionality of a superspace , and also the theories such as above mentioned theories play a crucial role in determining the Dimensionality of a superspace in the context , where the three of them work simulatenously. Let's see how the above three theories effect the Dimensionality of superspace.

To go Over this we will have to understand , an important extension of Quantum Mechanics and Einsteinian Physics, which is called Quantum Field Theory and how it encompasses one of the important fundamental theoretical concept called Distribution theory within it. It is this Distribution theory that will help us to scale the superspace.

In theoretical physics, **quantum field theory** (**QFT**) is a theoretical framework that combines classical field theory, special relativity, and quantum mechanics.[1]:xi QFT is used in particle physics to construct physical models of subatomic particles and in condensed matter physics to construct models of quasiparticles. The current standard model of particle physics is based on quantum field theory.

QFT treats particles as excited states (also called quantum levels) of their underlying quantum fields, which are more fundamental than the particles. The equation of motion of the particle is determined by minimization of the action computed for the Lagrangian, a function of fields associated with the particle. Interactions between particles are described by interaction terms in the Lagrangian involving their corresponding quantum fields. Each interaction can be visually represented by Feynman diagrams according to perturbation theory in quantum mechanics.

Classical fields

See also: Classical field theory

A classical field is a function of spatial and time coordinates.[31] Examples include the gravitational field in Newtonian gravity $\mathbf{g}(\mathbf{x}, t)$ and the electric field $\mathbf{E}(\mathbf{x}, t)$ and magnetic field $\mathbf{B}(\mathbf{x}, t)$ in classical electromagnetism. A classical field can be thought of as a numerical quantity assigned to every point in space that changes in time. Hence, it has infinitely many degrees of freedom.[31][32]

Many phenomena exhibiting quantum mechanical properties cannot be explained by classical fields alone. Phenomena such as the photoelectric effect are best explained by discrete particles (photons), rather than a spatially continuous field. The goal of quantum field theory is to describe various quantum mechanical phenomena using a modified concept of fields.

Canonical quantization and path integrals are two common formulations of QFT.[33]:61 To motivate the fundamentals of QFT, an overview of classical field theory follows.

UNDERSTANDING THE USAGE OF QUANTUM FIELD THEORY

Quantum Field Theory (QFT) is a fundamental framework in theoretical physics that blends quantum mechanics with special relativity to describe the behavior of fields and particles. It is the basis for understanding a wide range of physical phenomena, from the interactions of subatomic particles to the dynamics of the early universe.

It has some important key concepts which help the quantum field theory to map over space time . These key concepts being:-

Quantum Fields :- In QFT, particles are viewed as excitations of underlying fields that permeate space and time. Each type of particle corresponds to a specific field. For instance, the electromagnetic field is associated with photons.

QFT introduces fields that are defined at every point in spacetime. These fi fields are quantum analogs of classical fields in classical field theory.

Each type of particle corresponds to a specific field. For example, the electron field corresponds to electrons, while the electromagnetic field corresponds to photons.

Field Operators- : These fields are represented by operators in QFT. The field operators create and annihilate particles at various points in space and time, reflecting the probabilistic nature of quantum mechanics.

Field operators are mathematical objects that create and annihilate particles at different points in spacetime. These operators are associated with the fields defined over spacetime.

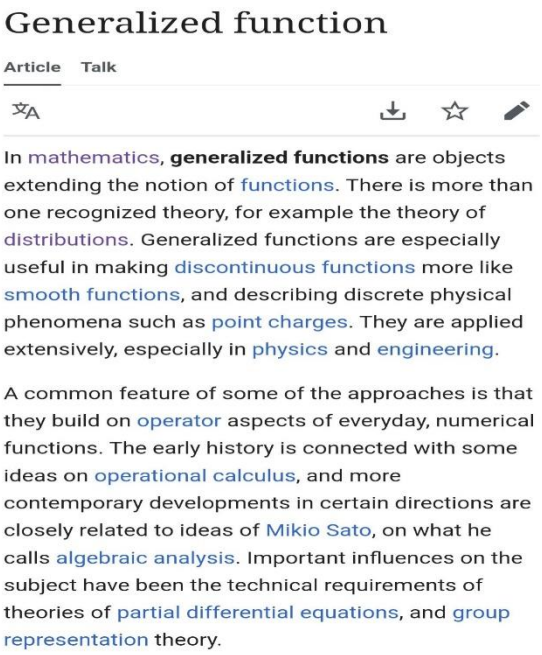
They are used to describe the dynamics of particles and interactions between them.

Quantum States:-

Quantum states in QFT describe the state of the system at a given point in time. They are represented by vectors in a Hilbert space, which is a mathematical space used to model quantum systems.

These states encode information about the particle content and the configuration of fields

DISTRIBUTION THEORY IN QUANTUM FIELD THEORY



Generalized function

Article Talk

In mathematics, **generalized functions** are objects extending the notion of functions. There is more than one recognized theory, for example the theory of distributions. Generalized functions are especially useful in making discontinuous functions more like smooth functions, and describing discrete physical phenomena such as point charges. They are applied extensively, especially in physics and engineering.

A common feature of some of the approaches is that they build on operator aspects of everyday, numerical functions. The early history is connected with some ideas on operational calculus, and more contemporary developments in certain directions are closely related to ideas of Mikio Sato, on what he calls algebraic analysis. Important influences on the subject have been the technical requirements of theories of partial differential equations, and group representation theory.

Distributions, also known as **Schwartz distributions** or **generalized functions**, are objects that generalize the classical notion of functions in mathematical analysis. Distributions make it possible to differentiate functions whose derivatives do not exist in the classical sense. In particular, any locally integrable function has a distributional derivative.

Distributions are widely used in the theory of partial differential equations, where it may be easier to establish the existence of distributional solutions (weak solutions) than classical solutions, or where appropriate classical solutions may not exist. Distributions are also important in physics and engineering where many problems naturally lead to differential equations whose solutions or initial conditions are singular, such as the Dirac delta function.

Why distribution theory is needed in quantum field theory

Distribution theory, also known as the theory of generalized functions, is a mathematical framework that extends the notion of classical functions to include objects that are not well-behaved in the traditional sense. These objects, called distributions or generalized functions, are used to represent certain types of singular or discontinuous functions that arise in various branches of physics, including Quantum Field Theory (QFT).

There are some important aspects where it is required and is inherently fundamental within Quantum Field Theory.

1)Handling Singularities:

Quantum Field Theory involves calculations that often lead to expressions containing singularities, such as delta functions or distributions arising from divergent integrals.

Distributions provide a rigorous way to handle these singularities, allowing physicists to manipulate and evaluate expressions involving them without encountering mathematical inconsistencies.

2) Regularization and Renormalization:

Distributions play a crucial role in regularization and renormalization techniques in QFT. These techniques are used to deal with divergent integrals that arise in perturbative calculations.

By redefining physical parameters (such as masses and charges) through renormalization, physicists can remove infinities from physical observables, ensuring that QFT predictions are finite and meaningful.

3) Field Operators:

In QFT, fields are represented by field operators that create and annihilate particles at different points in spacetime. These operators are often distribution-valued, particularly in interacting theories.

Distributions provide a way to define these operators rigorously, even when they act on states that do not belong to the usual Hilbert space of quantum states.

4)Feynman Diagrams and Scattering Amplitudes:

Feynman diagrams are graphical representations of perturbative calculations in QFT, used to visualize and compute scattering amplitudes. These calculations often involve integrals containing distributions.

Distributions are used to handle loop integrals and vertex functions appearing in Feynman diagrams, ensuring that the resulting scattering amplitudes are well-defined and finite

In summary, distributions are indispensable tools in Quantum Field Theory, used to handle singularities, regularization, renormalization, define field operators, and ensure the consistency and rigor of QFT calculations. They provide a rigorous mathematical framework for dealing with the mathematical complexities of QFT and obtaining meaningful and accurate predictions.

Canonical quantization and path integrals are two common formulations of QFT.[33]:61 To motivate the fundamentals of QFT, an overview of classical field theory follows.

The simplest classical field is a real scalar field — a real number at every point in space that changes in time. It is denoted as $\phi(\mathbf{x}, t)$, where $\mathbf{x}$ is the position vector, and t is the time. Suppose the Lagrangian of the field, L, is

$$L = \int d^3x\, \mathcal{L} = \int d^3x \left[\frac{1}{2}\dot{\phi}^2 - \frac{1}{2}(\nabla\phi)^2 - \frac{1}{2}m^2\phi^2\right],$$

where $\mathcal{L}$ is the Lagrangian density, $\dot{\phi}$ is the time-derivative of the field, ∇ is the gradient operator, and m is a real parameter (the "mass" of the field). Applying the Euler–Lagrange equation on the Lagrangian:[1]:16

$$\frac{\partial}{\partial t}\left[\frac{\partial \mathcal{L}}{\partial(\partial\phi/\partial t)}\right] + \sum_{i=1}^{3}\frac{\partial}{\partial x^i}\left[\frac{\partial \mathcal{L}}{\partial(\partial\phi/\partial x^i)}\right] - \frac{\partial \mathcal{L}}{\partial \phi} = 0,$$

we obtain the equations of motion for the field, which describe the way it varies in time and space:

$$\left(\frac{\partial^2}{\partial t^2} - \nabla^2 + m^2\right)\phi = 0.$$

This is known as the Klein–Gordon equation.[1]:17

The Klein–Gordon equation is a wave equation, so its solutions can be expressed as a sum of normal modes (obtained via Fourier transform) as follows:

$$\phi(\mathbf{x}, t) = \int \frac{d^3p}{(2\pi)^3}\frac{1}{\sqrt{2\omega_{\mathbf{p}}}}\left(a_{\mathbf{p}}e^{-i\omega_{\mathbf{p}}t + i\mathbf{p}\cdot\mathbf{x}} + a^*_{\mathbf{p}}e^{i\omega_{\mathbf{p}}t - i\mathbf{p}\cdot\mathbf{x}}\right.$$

Two-point correlation function

Main article: Correlation function (quantum field theory)

In calculations, one often encounters expression like $\langle 0|T\{\phi(x)\phi(y)\}|0\rangle$ or $\langle \Omega|T\{\phi(x)\phi(y)\}|\Omega\rangle$ in the free or interacting theory, respectively. Here, x and y are position four-vectors, T is the time ordering operator that shuffles its operands so the time-components x^0 and y^0 increase from right to left, and $|\Omega\rangle$ is the ground state (vacuum state) of the interacting theory, different from the free ground state $|0\rangle$. This expression represents the probability amplitude for the field to propagate from y to x, and goes by multiple names, like the two-point propagator, two-point correlation function, two-point Green's function or two-point function for short.[1]:82

The free two-point function, also known as the Feynman propagator, can be found for the real scalar field by either canonical quantization or path integrals to be[1]:31,288[33]:23

$$\langle 0|T\{\phi(x)\phi(y)\}|0\rangle \equiv D_F(x-y) = \lim_{\epsilon\to 0}\int \frac{d^4p}{(2\pi)^4}\frac{i}{p_\mu p^\mu - m^2 + i\epsilon}e^{-ip_\mu(x^\mu - y^\mu)}.$$

In an interacting theory, where the Lagrangian or Hamiltonian contains terms $L_I(t)$ or $H_I(t)$ that describe interactions, the two-point function is more difficult to define. However, through both the canonical quantization formulation and the path integral formulation, it is possible to express it through an infinite perturbation series of the *free* two-point function.

In canonical quantization, the two-point correlation function can be written as:[1]:87

$$\langle \Omega|T\{\phi(x)\phi(y)\}|\Omega\rangle = \lim_{T\to\infty(1-i\epsilon)}\frac{\left\langle 0\left|T\left\{\phi_I(x)\phi_I(y)\exp\left[-i\int_{-T}^{T}dt\,H_I(t)\right]\right\}\right|0\right\rangle}{\left\langle 0\left|T\left\{\exp\left[-i\int_{-T}^{T}dt\,H_I(t)\right]\right\}\right|0\right\rangle},$$

Path integrals

Main article: Path integral formulation

The path integral formulation of QFT is concerned with the direct computation of the scattering amplitude of a certain interaction process, rather than the establishment of operators and state spaces. To calculate the probability amplitude for a system to evolve from some initial state $|\phi_I\rangle$ at time $t = 0$ to some final state $|\phi_F\rangle$ at $t = T$, the total time T is divided into N small intervals. The overall amplitude is the product of the amplitude of evolution within each interval, integrated over all intermediate states. Let H be the Hamiltonian (*i.e.* generator of time evolution), then[33]:10

$$\langle\phi_F|e^{-iHT}|\phi_I\rangle = \int d\phi_1\int d\phi_2\cdots\int d\phi_{N-1}\,\langle\phi_F|e^{-iHT/N}|\phi_{N-1}\rangle\cdots\langle\phi_2|e^{-iHT/N}|\phi$$

Taking the limit $N \to \infty$, the above product of integrals becomes the Feynman path integral:[1]:282[33]:12

$$\langle\phi_F|e^{-iHT}|\phi_I\rangle = \int \mathcal{D}\phi(t)\,\exp\left\{i\int_0^T dt\,L\right\},$$

where L is the Lagrangian involving ϕ and its derivatives with respect to spatial and time coordinates, obtained from the Hamiltonian H via Legendre transformation. The initial and final conditions of the path integral are respectively

$$\phi(0) = \phi_I, \quad \phi(T) = \phi_F.$$

In other words, the overall amplitude is the sum over the amplitude of every possible path between the initial and final states, where the amplitude of a path is given by the exponential in the integrand.

Correlation functions in the interacting theory can be written as a perturbation series. Each term in the series is a product of Feynman propagators in the free theory and can be represented visually by a Feynman diagram. For example, the λ^1 term in the two-point correlation function in the ϕ^4 theory is

$$\frac{-i\lambda}{4!}\int d^4z\,\langle 0|T\{\phi(x)\phi(y)\phi(z)\phi(z)\phi(z)\phi(z)\}|0\rangle.$$

After applying Wick's theorem, one of the terms is

$$12\cdot\frac{-i\lambda}{4!}\int d^4z\,D_F(x-z)D_F(y-z)D_F(z-z).$$

This term can instead be obtained from the Feynman diagram



The diagram consists of

- *external vertices* connected with one edge and represented by dots (here labeled x and y).
- *internal vertices* connected with four edges and represented by dots (here labeled z).
- *edges* connecting the vertices and represented by lines.

The above scans provided , show how distribution functions are used within path integrals , as propagates, also within Feynman Diagram , and used as Scaler field Operator. The above scans just emphasize the fact how Distribution theory and Distribution in general are fundamental aspects of Quantum field theory.

So when we use Quantum field theory to scale the Garlic Junior Dead Zone we are basically using the Distribution theory and along with Supersymmtery to arrive at our desired Interpretation of super space

DISTRIBUTION THEORY FOR SCALING SUPER SPACE

_Now we will see how Distribution theory works when we try to scale super space using it.

Superspace

Article Talk

Superspace is the coordinate space of a theory exhibiting supersymmetry. In such a formulation, along with ordinary space dimensions *x*, *y*, *z*, ..., there are also "anticommuting" dimensions whose coordinates are labeled in Grassmann numbers rather than real numbers. The ordinary space dimensions correspond to bosonic degrees of freedom, the anticommuting dimensions to fermionic degrees of freedom.

The word "superspace" was first used by John Wheeler in an unrelated sense to describe the configuration space of general relativity; for example, this usage may be seen in his 1973 textbook *Gravitation*.

Distributions, also known as **Schwartz distributions** or **generalized functions**, are objects that generalize the classical notion of functions in mathematical analysis. Distributions make it possible to differentiate functions whose derivatives do not exist in the classical sense. In particular, any locally integrable function has a distributional derivative.

Distributions are widely used in the theory of partial differential equations, where it may be easier to establish the existence of distributional solutions (weak solutions) than classical solutions, or where appropriate classical solutions may not exist. Distributions are also important in physics and engineering where many problems naturally lead to differential equations whose solutions or initial conditions are singular, such as the Dirac delta function.

We know that super space is a coordinate space of a theory exhibiting supersymmetry. A superspace encompasses the symmetry between fermions and bosons . The bosonic coordinates are referred to using real numbers while the fermionic degrees of freedom are referred to using Grassmann numbers.

When Quantum field theory is brought into consideration , the concept of fields defined over space time comes it place. The quantum fields are fundamental entities in quantum field theory (QFT), which is the framework for understanding the behavior of particles and their interactions at the quantum level. But when supersymmetry is extended , within Quantum Field Theory,

The Fields are now defined as super fields , which are functions defined Over super space.

But no, quantum fields do not interact with matter. Quantum fields *are* matter. In a quantum field theory, what we perceive as particles are excitations of the quantum field itself.

The simplest "practical" quantum field theory is quantum electromagnetism. In it, two fields exist: the electromagnetic field and the "electron field". These two fields continuously interact with each other, energy and momentum are transferred, and excitations are created or destroyed. So for instance, what we picture intuitively as an electron absorbing a photon is, in quantum electrodynamics, a specific interaction between the electromagnetic field and the electron field, in which the electromagnetic field loses one excitation quantum, and the electron field gains its energy, momentum and angular momentum.

Supermultiplet

Article Talk

In theoretical physics, a **supermultiplet** is a representation of a supersymmetry algebra, possibly with extended supersymmetry.

Then a **superfield** is a field on superspace which is valued in such a representation. Naïvely, or when considering flat superspace, a superfield can simply be viewed as a function on superspace. Formally, it is a section of an associated supermultiplet bundle.

Phenomenologically, superfields are used to describe particles. It is a feature of supersymmetric field theories that particles form pairs, called superpartners where bosons are paired with fermions.

These supersymmetric fields are used to build supersymmetric quantum field theories, where the fields are promoted to operators.

The superfields encompass both bosonic and fermionic degrees of freedom and the corresponding particles in space time are basically excitations of these Super fields.

Super fields unify bosonic and fermionic degrees of freedom into a single mathematical object. A superfield is a function defined on superspace that encapsulates both bosonic and fermionic fields and their interactions. This unification is essential for supersymmetry, which relates bosons and fermions..

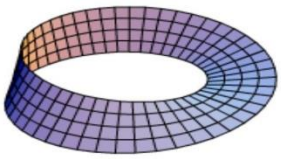
Superfields are expanded in terms of Grassmann variables, which are anticommuting variables representing the fermionic degrees of freedom. Since Grassmann variables do not commute with each other, the expansion of superfields in terms of Grassmann variables leads to an infinite number of terms, contributing to the infinite dimensionality of superspace.

The real reason super space becomes Infinte Dimensional is due to the fact that it acts as a Quantum Configuration space encompassing all possible superfield configuration.

Configuration space (mathematics)

Article Talk

In mathematics, a **configuration space** is a construction closely related to state spaces or phase spaces in physics. In physics, these are used to describe the state of a whole system as a single point in a high-dimensional space. In mathematics, they are used to describe assignments of a collection of points to positions in a topological space. More specifically, configuration spaces in mathematics are particular examples of configuration spaces in physics in the particular case of several non-colliding particles.



The configuration space of all unordered pairs of points on the circle is the Möbius strip.

In quantum mechanics, the Hilbert space is the space of complex-valued functions belonging to $L^2(\mathbb{R}^3, d^3x)$, where the simple $\mathbb{R}^3$ is the classical configuration space of free particle which has finite degrees of freedom, and d^3x is the Lebesgue measure on $\mathbb{R}^3$. In the quantum mechanics the domain space of the wave functions ψ is the classical configuration space $\mathbb{R}^3$.

In classical field theory, the configuration space of the field is an infinite-dimensional space. The single point denoted A in this space is represented by the set of functions $A_I(\vec{x}) \in \mathbb{R}^3$ where $\vec{x} \in \mathbb{R}^3$ and I represents an index set.

In quantum field theory, it is expected that the Hilbert space is also the L^2 space on the configuration space of the field, which is infinite dimensional, with respect to some Borel measure naturally defined. However, it is often hard to define a concrete Borel measure on the classical configuration space, since the integral theory on infinite dimensional space is involved.[1]

In Quantum Mechanics, field theory and Functional analysis The space of all possible superfield configurations can be represented as a functional space, where each point corresponds to a particular superfield configuration. This functional space is infinite-dimensional due to the infinite number of possible terms in the expansion of superfields, each corresponding to a different combination of Grassmann variables.

Here the super space acts as a Configuration space for all possible Configuration of super fields in space time. Now one might ask , that how does , all possible Configurations of Super fields amount to Infinity and how each of these Configuration add to a dimension in super space.

Let's understand the important reasons behind it

The infinite nature of possible configurations of superfields arises from the infinite expansion of these fields in terms of Grassmann variables. Here's how:

1. **Grassmann variables: In supersymmetric theories, Grassmann variables are introduced to describe fermionic degrees of freedom. These variables are anti-commuting, meaning their order matters, and they do not satisfy the usual rules of commutativity. Because they are anti-commuting, there is no limit to the number of distinct Grassmann variables that can be included.**

2. **Expansion of superfields : Superfields, which encapsulate the dynamics of supersymmetric theories, depend not only on ordinary space-time coordinates but also on Grassmann-valued coordinates. When expanding superfields, each additional term involves products of ordinary coordinates and Grassmann variables. Since there is no limit to the number of Grassmann variables, there is an infinite number of possible terms in the expansion of superfields.**

3. **Infinite-dimensional super space: Each term in the expansion of superfields corresponds to a different combination of Grassmann variables. Since there is no upper bound on the number of Grassmann variables that can be included in each term, the space of all possible superfield configurations becomes infinite-dimensional. Each distinct combination of Grassmann variables contributes to a new "direction" or dimension in super space.**

4. **Functional representation: Mathematically, the space of all possible superfield configurations can be represented as a functional space, where each point corresponds to a particular superfield configuration. The coordinates of this space consist of both ordinary space-time coordinates and Grassmann variables. Since there is an infinite number of possible Grassmann variables, this functional space becomes infinite-dimensional.**

In summary, the infinite nature of possible configurations of superfields arises from the infinite expansion of superfields in terms of Grassmann variables. Each additional configuration corresponds to a different combination of Grassmann variables, contributing to a new dimension in super space. This infinite-dimensional super space allows for a rich description of the dynamics of supersymmetric theories.

Now let us see what role Does distribution theory play , in making the infinite dimensional nature of superspace As axiomatic and self Evident, . And what roles does it play to make sure , a super space reaches Infinte Dimensionality

The inclusion of distribution theory in the interpretation of infinite-dimensional super space makes the understanding of super space axiomatic and inherent due to its treatment of generalized functions. Here's how distribution theory plays a crucial role:

1. **Handling Grassmann-valued coordinates: In supersymmetric theories, Grassmann variables are essential for describing fermionic degrees of freedom. These variables are not ordinary functions but rather elements of a Grassmann algebra, which cannot be represented by traditional pointwise functions. Distribution theory provides a framework for dealing with such non-standard functions and extends the notion of functions to include distributions.**

2. **Generalized functions: Distributions, or generalized functions, are objects that act on test functions to produce real numbers. They generalize the concept of functions and can include objects like Dirac delta functions or step functions, which do not have well-defined pointwise values. In the context of supersymmetric theories, Grassmann variables can be understood as distributions on super space, acting on test functions defined on the same space.**

3. **Integration over super space: In order to define physical observables in supersymmetric theories, one often needs to integrate over super space. This integration involves integrating over both ordinary space-time coordinates and Grassmann variables. Distribution theory provides a rigorous framework for defining such integrals, ensuring that they are well-defined even in the presence of Grassmann variables.**

4. **Representation of superfields: Superfields, which are functions defined on super space, can be understood as distributions in distribution theory. They act on test functions defined on super space, producing real numbers. This representation allows for a unified treatment of superfields within the framework of distribution theory, making the interpretation of super space inherent to the theory.**

5. **Infinite-dimensional functional space : Distribution theory also facilitates the interpretation of super space as an infinite-dimensional functional space. Each point in this space corresponds to a particular superfield configuration, and the coordinates of this space include both ordinary space-time coordinates and Grassmann variables. The infinite-dimensional nature of super space is naturally accommodated within the framework of distribution theory.**

In summary, distribution theory plays a crucial role in the interpretation of infinite-dimensional super space by providing a framework for handling Grassmann-valued coordinates, defining integration over super space, representing superfields as distributions, and interpreting super space as an infinite-dimensional functional space. By incorporating distribution theory, the understanding of super space becomes axiomatic and inherent to the theory of supersymmetric theories.

Thus we have went over the entire concept of how Quantum field theory and Distribution theory works together in tandem to make sure That super space Actually becomes Infinte Dimensional instead of the general Finite Dimensional interpretation of it.

Thus the Garlic Junior Dead Zone, Will be Infinte Dimensional in context to Einsteinian Physics, Quantum Field Theory, and distribution theory working together at every step.

Now I would like to include a short extra note, which discusses another way which you can use to prove the Garlic junior super space being Infinte dimensional. In case the readers find this method lengthy and confusing

ANOTHER WAY FOR INFINTE DIMENSIONALITY

This comes into play when super space is considered as a Configuration space within general relativity.

In the context of general relativity, super space can indeed be conceptualized as the configuration space of all possible geometries of the universe. This space represents the space of all possible 3-dimensional spatial metrics up to diffeomorphism, which are coordinate transformations that do not change the underlying geometry of space. Here's how this configuration space can be understood as infinite-dimensional:

1. **Infinite degrees of freedom: The metric tensor describing the geometry of spacetime has an infinite number of independent components. In the case of 3-dimensional spatial metrics, the metric tensor has six independent components: three diagonal elements representing the spatial lengths along each axis, and three off-diagonal elements representing the spatial curvature or tilt. Each component can vary independently, leading to an infinite number of possible metric configurations.**

2. **Parametrization of metrics: To specify a metric, one needs to provide a prescription for the values of its components at each point in space. This requires specifying functions for each component, which effectively involves an infinite number of parameters. For example, one might choose to parametrize the metric using a set of basis functions or Fourier modes, each of which can vary continuously, leading to an infinite-dimensional space of possible metric configurations.**

3. **Coordinate transformations : The configuration space also includes diffeomorphisms, which are coordinate transformations that preserve the underlying geometry of space. Diffeomorphisms introduce additional degrees of freedom into the configuration space, corresponding to the freedom to choose different coordinate systems to represent the same underlying geometry. Since there is an infinite number of possible coordinate transformations, the space of all possible 3-dimensional spatial metrics up to diffeomorphism is infinite-dimensional.**

4. **Functional representation : Mathematically, the configuration space can be represented as a functional space, where each point corresponds to a particular metric configuration, and the coordinates of this space are functions defined over space. Since there is no upper bound on the number of independent components of the metric, this functional space is infinite-dimensional.**

This is a general over view of how super space acts a function space of all Possible Configuration of 3d spatial geometry. . But the Metrics used over here in context to General Relativity, are essentially Riemannian metrics, and a configuration space of all possible Riemannian metrics ,will be Inherently Infinte dimensional. Making the interpretation of super space within general relativity, as an Infinte dimensional space , as a self Evident outcome. Since each configuration of spatial geometry of the universe will have it's own Riemannian metrics associated with it. So an Infinte number of them will have Infinte Riemannian Metrics.

Now, let's delve into why the space of all Riemannian metrics is infinite-dimensional:

1. **Degrees of Freedom: A Riemannian metric is described by a collection of functions that specify how distances and angles aremeasuredat every**

point in space. These functions can vary independently at each point, giving rise to an infinite number of degrees of freedom.

2. **Continuous Variation: The space of Riemannian metrics is not discrete but continuous. This means that between any two Riemannian metrics, there are infinitely many other possible metrics. Think of it like a smooth continuum where you can continuously change the curvature and geometry of space at every point.**

3. **Arbitrarily Small Changes At any given point in space, you can make arbitrarily small changes to the metric, resulting in an infinite number of possible variations. This is because the functions defining the metric can be adjusted infinitely finely.**

4. **Functional Space: The space of all Riemannian metrics is not just a regular Euclidean space with a finite number of dimensions; rather, it's a functional space, where each point corresponds to a function (or a set of functions). Functional spaces are inherently infinite-dimensional because functions can have an infinite number of parameters.**

5. **Mathematical Structure: The mathematical framework used to describe Riemannian metrics involves infinite-dimensional spaces, such as function spaces and Hilbert spaces. These spaces are essential for capturing the full richness of the space of all possible metrics.**

In summary, the space of all Riemannian metrics is infinite-dimensional due to the continuous variation and infinitely many degrees of freedom associated with specifying the curvature and geometry of space at every point. This infinite-dimensional structure is essential for understanding the vast complexity of spacetime in general relativity.

This ends our discussion about how The Garlic Junior Dead Zone can be Comprehended to be infinite-dimensional via two different ways.

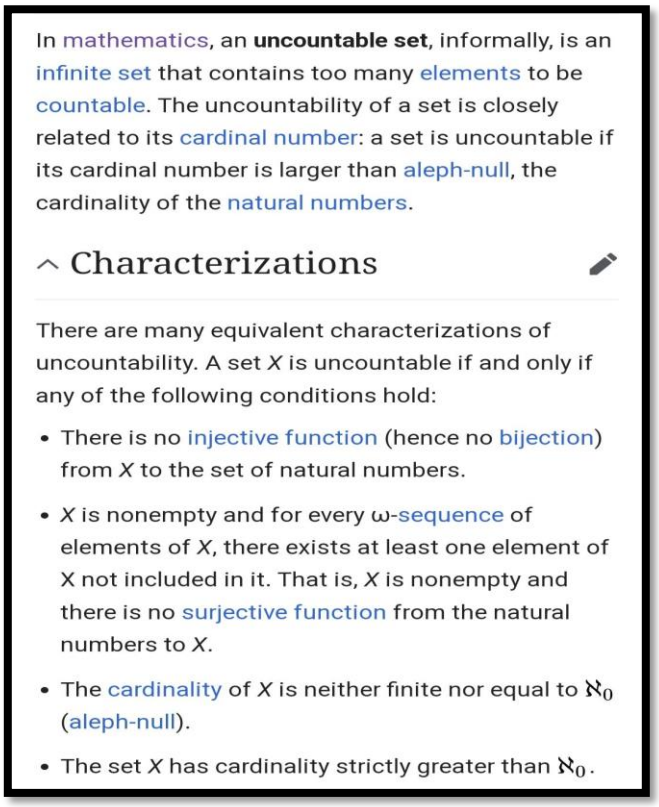
Either of the two ways could be used to establish the fact that The Garlic Junior Dead Zone Is Inherently Infinite Dimensional due to the Ontological existence of Einsteinian Physics, Quantum Mechanics and Supersymmetry.

Now the real question arises is, what level of Infinity are we Talking about??

Is to COUNTABLE INFINTE or UNCOUNTABLE INFINITE??. Well being honest, I would like to disclose the fact that all this while we have just been discussing about an UNCOUNTABLE INFINITE SPACE., and not a countable Infinite one , as most people assume it to be. Let's get over the fact why it is axiomatically Uncountable Infinity Dimensionality

PROVING UNCOUNTABLE INFINITE DIMENSIONALITY

In mathematics basically two different types of Infinity Exist , Countable Infinte and Uncountable Infinity .

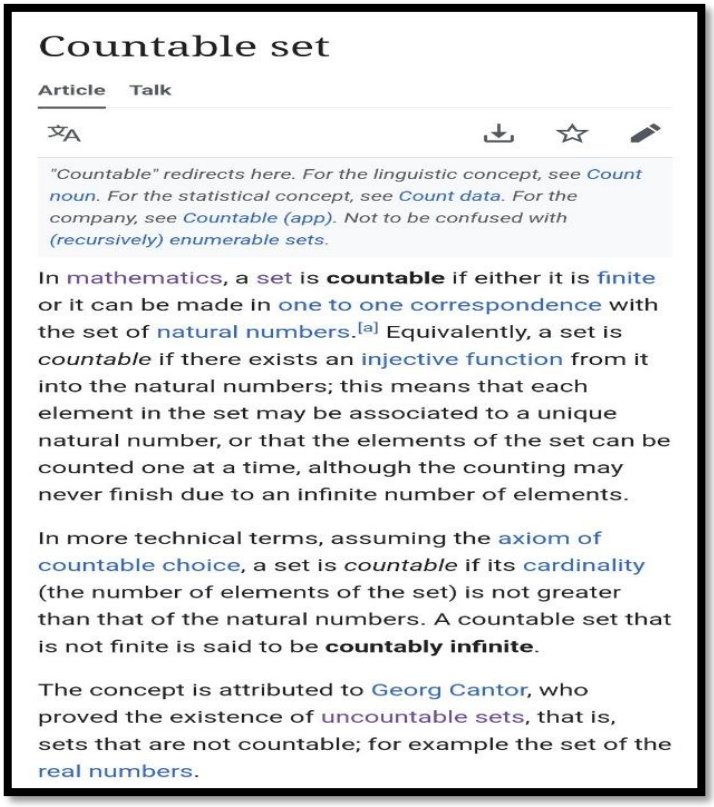


In mathematics, an **uncountable set**, informally, is an infinite set that contains too many elements to be countable. The uncountability of a set is closely related to its cardinal number: a set is uncountable if its cardinal number is larger than aleph-null, the cardinality of the natural numbers.

Characterizations

There are many equivalent characterizations of uncountability. A set X is uncountable if and only if any of the following conditions hold:

- There is no injective function (hence no bijection) from X to the set of natural numbers.
- X is nonempty and for every ω-sequence of elements of X, there exists at least one element of X not included in it. That is, X is nonempty and there is no surjective function from the natural numbers to X.
- The cardinality of X is neither finite nor equal to $\aleph_0$ (aleph-null).
- The set X has cardinality strictly greater than $\aleph_0$.



Countable set

Article Talk

"Countable" redirects here. For the linguistic concept, see Count noun. For the statistical concept, see Count data. For the company, see Countable (app). Not to be confused with (recursively) enumerable sets.

In mathematics, a set is **countable** if either it is finite or it can be made in one to one correspondence with the set of natural numbers.[a] Equivalently, a set is *countable* if there exists an injective function from it into the natural numbers; this means that each element in the set may be associated to a unique natural number, or that the elements of the set can be counted one at a time, although the counting may never finish due to an infinite number of elements.

In more technical terms, assuming the axiom of countable choice, a set is *countable* if its cardinality (the number of elements of the set) is not greater than that of the natural numbers. A countable set that is not finite is said to be **countably infinite**.

The concept is attributed to Georg Cantor, who proved the existence of uncountable sets, that is, sets that are not countable; for example the set of the real numbers.

Now we will be going over how A super space when it is used in qunatum field theory as a Configuration space for all possible field Configurations within space time , then it's Dimensionality is UNCOUNTABLE Infinity

Let's delve into the explanation provided for thus assertion :-

1. Field Configurations and Uncountable Infinity:

- In quantum field theory (QFT), the configuration space of a field is the set of all possible field configurations.

- For example, for a scalar field ϕ(x), where x represents spacetime coordinates, the configuration space is the set of all functions ϕ: ℝ^4 → ℝ.

- The set of all possible functions from a continuous domain (like ℝ^4 for spacetime) to another continuous range (like ℝ for field values) is uncountably infinite. This is because at each point in spacetime, the field can take any real value, and the set of real numbers ℝ is uncountably infinite.

- Thus, when considering all possible field configurations, we are dealing with the space of functions, which forms an infinite-dimensional functional space. The dimensionality here is related to the cardinality of the continuum (ℵ), representing uncountable infinity.

2. Superfields and Superspace:

- In supersymmetric theories, like supersymmetry, we extend the concept of configuration space to superspace, which includes both bosonic (commuting) and fermionic (Grassmann, anti-commuting) coordinates.

- The set of possible values for bosonic coordinates is continuous, thus uncountably infinite.

- Grassmann variables introduce a more complex structure. While each Grassmann variable itself is not continuous, the space of possible values (considering all Grassmann coordinates collectively) contributes to the overall

dimensionality. However, the combination of continuous spacetime dimensions and the algebraic structure of Grassmann variables still results in an uncountably infinite dimensional space when considering the full superspace.

3. Mathematical Consistency:

- In quantum mechanics and QFT, the state space (Hilbert space) of a system with a continuous spectrum is uncountably infinite. The space of wavefunctions or field configurations involves continuous variables, leading to uncountable dimensions.

- In functional analysis, the space of all possible functions (or distributions) over a continuous domain is an infinite-dimensional vector space with uncountable dimensions.

Conclusion:

The infinite-dimensional nature of the configuration spaces in QFT and the extended superspace in supersymmetric theories is uncountably infinite. This conclusion arises from the continuous nature of spacetime coordinates and the functional spaces involved in field configurations and state spaces. The combination of continuous dimensions and the algebraic structure of superfields implies that superspace, as described in these theories, is uncountably infinite.

Thus we have firmly established the fact that the Garlic Junior's Dead Zone Is a super space with Uncountable Infinite Dimensionality. And not a superspace which is Finite Dimensional in any way , shape or form

This wraps up our portion of scaling and now we will be heading to the conclusion as to where it gets us in different Tiering systems .

CONCLUSION :-

Well it seems we have established all that we have wanted to and finally arrived at our conclusion that the Garlic Junior Dead Zone Is actually a super spec with Uncountable Infinite Dimensionality and not just finite Dimensionality.

But I just thought of adding something at the last regarding the Canonicity of Garlic Junior , and the Dragon ball Movie :- Dead Zone .

Garlic Junior Saga is basically an Official Saga within the anime and extends from episode 108 to 117.

The **Garlic Jr. Saga** (ガーリックＪｒ編 (ジュニア), *Gārikku Junia Hen*, lit. "Garlic Junior Arc") is the sixth saga in the *Dragon Ball Z* series. This saga is entirely filler material written by Katsuyuki Sumisawa, and is not present in the original *Dragon Ball* manga by Akira Toriyama. It occurs between the Frieza Saga and the Trunks Saga.

Garlic Jr.'s story is based on events of the movie *Dragon Ball Z: Dead Zone*. In *Dead Zone*, Garlic Jr. is defeated by Goku's four-year-old son, Gohan, showing Gohan's incredible talent for fighting. The saga details Garlic Jr.'s return and his desire for revenge, and with Goku and Vegeta absent, it is left up to the Z-Fighters to counter him alone.

In Japan, the Garlic Jr. Saga aired on TV in 1991. In the U.S., it is the first part of season four and aired in mid-2000.

Releases

Funimation VHS/DVD Volumes

- Garlic Jr. Saga - Black Water Mist (93-95)
- Garlic Jr. Saga - Sacred Water (96-98)
- Garlic Jr. Saga - Vanquished (99-102)

Note: Funimation released both edited and uncut VHS volumes, while the DVDs are uncut only.

Funimation Remastered DVD Sets

- Dragon Ball Z Season Four (108-139) (only episodes 108-117 are part of the Garlic Jr. Saga)

Funimation Dragon Box Sets

- Dragon Ball Z: Dragon Box Vol. 3 (85-126) (only episodes 108-117 are part of the Garlic Jr. Saga)

Funimation Season Blu-ray Sets

- Dragon Ball Z Season Four (108-139) (only episodes 108-117 are part of the Garlic Jr. Saga)

Yeah , since I brought the word " OFFICIAL " here , quote a lot of people are ready to call it NON CANON/ FILLER ARC, based on the above scan from Fandom . Well this information by Fandom is an incorrect information. Since Toriyama had never made any statement saying that Garlic Junior Movie is NON CANON/FILLER . On the other hand he has given statements calling all Filler Extension Arcs , as ORIGINAL WORKS within the anime.



Japanese

これは本にのった１話ぶんをアニメにしたばあい１０分たらずで
おわってしまい、３０分番組ではたちまち原作のマンガにおいついてしまうので
アニメスタッフの人達が オリジナルのをいれて調節していただいているからです。
アニメってほんとにたいへんなんです ね。
ごくろうさまです。
マンガもアニメもよろしくねこ

English (US)

The animation staff has adjusted the length of the original story to fit the time frame.
The reason for this is that the animation staff has to adjust the length of the program by adding original material.
It is really hard work to make an animation.
Thank you very much.
Best wishes for both the manga and the anime.

In the translation for the above japanese text Toriyama specifically mentions that The Animation staff of Toei , headed by Katsuyuki Sumisawa, adjusted the Length of the anime , to fit the time frame,

And they did so by Adding Original works (Or Extensions arcs) between each Major arc . Like Garlic Junior arc which was added by Toei itself , who has authorative Rights for Dragon ball anime. The One responsible for the Creation of Story is Katsuyuki Sumisawa, who Himself is a former Dragon ball Screenwriter , and an Important member of Dragon ball staff who worked under Takao Koyama.. and yes TOEI does have Authorative Rights over Dragon ball animation , and Toriyama himself is responsible for overseeing all the Inclusions and changes made by TOEI to the Dragon ball anime . Since SUMISAWA is a former Dragon ball Staff, his authority can only be Discarded by TOEI or Toriyama himself, who can dismiss his works if they wanted. But both Toriyama and TOEI approve of Sumisawa's animation , of Garlic Junior Saga in the anime.

Katsuyuki Sumisawa entered Takao Koyama's school in 1987. He wrote screenplays for *Dragon Ball*, *Dragon Ball Z*, and *Dragon Ball Z Kai*, as well as the TV special *Dragon Ball Z: Bardock – The Father of Goku*.

Outside of the *Dragon Ball* franchise, Sumisawa worked on *Bakusou Kyoudai Let's & Go*, *Blue Dragon*, *Chō Seimeitai Transformers: Beast Wars Neo*, *Clamp School*, *(The) Daichis – Earth Defence Family*, *Girl From Phantasia*, *Happy Lucky Bikkuriman*, *InuYasha*, *Kaze no Yojimbo*, *Lord of Lords Ryu Knight*, *Miami Guns*, *Mobile Suit Gundam Wing*, *Naruto*, *Rave Master*, *Sailor Moon*, *Saiyuki Reload: Burial*, *Tokyo Underground*, *Yakitate!! Japan*, *You're Under Arrest*, *Yu Yu Hakusho: Ghost Files*, and *Zoids/ZERO*.

Staff in:
Bakusō Kyōdai Let's & Go!! (TV) : Script (13 episodes)
Bakusō Kyōdai Let's & Go!! WGP (TV) : Screenplay (11 episodes)
Black Jack 21 (TV) : Series Composition, Script (6 episodes)
Blue Dragon (TV) : Script
Brain Powered (TV) : Script (6 episodes)
Chiisana Kyojin Microman (TV) : Script (10 episodes)
Chō Seimeitai Transformers: Beast Wars Neo (TV) : Script (6 episodes)
Chosoku Spinner (TV) : Series Composition, Screenplay (11 episodes)
CLAMP School Detectives (TV) : Script (eps 5-6, 21)
Corrector Yui (TV) : Series Composition (season 1), Script (18 episodes)
Cutey Honey Flash (TV) : Script (9 episodes)
(The) Daichis - Earth Defence Family (TV) : Script (ep 9)
Dragon Ball (TV) : Script (eps 151-152)
Dragon Ball Z (TV) : Screenplay (72 episodes)
Dragon Ball Z Kai (TV) : Script (47 episodes)
Dragon Ball Z Kai (TV 2) : Screenplay (eps 105-106)
Dragon Ball Z: Bardock - The Father of Goku (special) : Screenplay
Dragon Quest: Dai no Daibōken (movie) : Screenplay
Dragon Quest: The Adventure of Dai (TV 2020) : Script (30

And yes Toriyama himself specifically said that Anime and Manga are seperate Continuities , but they have certain Similarities within them and a lot of differences. I would leave it to the Readers Comprehension, who have watched

Akira Toriyama Super Interview
3rd Round — A Fusion with Animation

When talking about *Dragon Ball*, one mustn't leave out the animated television adaptation. It expanded the fanbase, and fans even now continue to voice their support. The original creator, Akira Toriyama, speaks in his own words about the TV anime that he helped build!!

For this third Super Interview, *Sensei*, I'd like to ask you questions mainly pertaining to the animated television series *Dragon Ball* (henceforth abbreviated "DB"). First of all, do you watch the DB anime on TV?

> Yes. I watch while eating dinner and such, and with my children.

Do you watch, not as the "creator", but as an ordinary viewer?

> I do, actually. But at the very least, even while eating dinner, I still think to myself things like, "so that's how they did this scene," so I suppose it really is a bit different from being an ordinary viewer.

The TV anime includes parts that are original to it as well; do they also use some concepts that you yourself came up with, *Sensei*?

> It is partly things that get passed on to Toei Animation through my editor. When other TV-original segments air, it always makes my heart pound. Sort of like, "Ah, this sort of thing is nice, too".

Do you already have in mind detailed concepts for things that didn't appear in the original work?

> Generally, I had already thought of concepts, where I felt things should be a certain way. For example, when the story suddenly jumps forward to five years later, things like, "During those five years, something like this probably happened…".

For TV-original characters and such, did you give out any ideas?

> For the part where Goku is training at Kaiō-*sama*'s place, they said they wanted one more character, so I came up with a character named "Gregory" (see p.136).

When DB was set to be animated, did you make any particular demands?

> At first, I didn't say anything specific. I'm not the type to open my mouth much about these things, but after seeing it actually air, I felt that DB should feel a bit more like a fairy tale, so I did mention that bit. Basically, I leave things to [Toei], and only say a little tiny bit when I absolutely have to.

and read all the manga and anime , to understand what those differences are , since I do not believe that I have to extrapolate on them.

The above two scans just serve as the evidence of all the claims we made. In the first scan it is Emphatically clear , and Toriyama himself admits it that THE TIV ANIME has its own PARTS which are original / Canon only to itself, and some of these Concepts came from Toriyama himself. Toriyama approves that TOEI has Complete Authority, over Including stories ,in the anime. Since these extra works are Overseen by Toriyama and his editor himself, before TOEI uses them to be animated. It means the Garlic Junior Saga in the anime , basically contains those story PARTS , which are CANON ONLY TO THE ANIME , and NOT TO THE MANGA. . Toriyama himself mentions that , he himself Takes the mantle of Creating Ideas and Stories which are Only supposed to be Canon to the anime.

He mentions " If five years passed suddenly , then In those five years. These events might have happened" This talks about the filler arcs which lie between any two major arcs. And Toriyama himself admits that he plays an important role in creating those ideas . He even Mentions that he gave ideas for TV only Characters.

And yes the anime And Manga are two separate continuities entirely , said by Toriyama Himself.

Did you put in any requests when it was made into an anime, *Sensei*?

Toriyama:
No, not at all. Anime has its own way of doing things, so I think it's better to leave it to the professionals. Manga and anime are separate things, but I suppose it's best when you get the feeling that "they're connected somehow". At the start of serialization, I didn't even know if I'd be able to please the readers, so I wasn't even thinking about it being made into an anime.

Koyama:
Now, Japanese animation gives its dreams to children around the world, and among them, *Dragon Ball* stands at the forefront. I really feel a certain happiness at that. Having been able to share this treasure of a work in the same era, both the fans and I are happy.

Thus the reasoning that " bro it was only included in the anime , and not in Manga, so it's non canon , bro it has to appear in the primary source bro " falls short and rendered useless. Since Anime and Manga , have THEIR OWN SEPERATE CANON, each of then Completely independent of the other , abided

showing a few similarities. . So yes If Garlic Junior Saga is Canon to the anime , then it is a Canon work , which can be used for scaling, and there is no argument against it.

WHAT TIER DOES THE DEAD ZONE SCALE TO ??

CSAP TIERING SYSTEM :-

- High Hyperverse level: Countably Infinite-dimensional characters, or characters of any number of dimensions higher than countable infinity.

VERSUS BATTLES WIKI :-

High 1-B: High Hyperverse level

Characters who can significantly affect, create and/or destroy infinite-dimensional space. Characters who exceed infinite-dimensional realms without qualifying for any of the further tiers, or who can meddle with spaces whose dimension is uncountably infinite, should have a "**+**" (**High 1-B+**) modifier next to their tier.

Thus the Dead Zone Helps to get us at High Hyperversal in CSAP wiki , and High Hyperversal+ in Revised Versus Battles wiki Tiering system.

It will scale to Low outerversal in the current (Old) VSBW system btwm