Dium TOE: What Natural Dimension is Made Of

A Communication of the Intractable Studies Institute
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Abstract: The Institutes position on the universe is that dimension itself has to be re-solved before particles and forces. Such a solution is provided here.
-Director

1. Modeling Rules

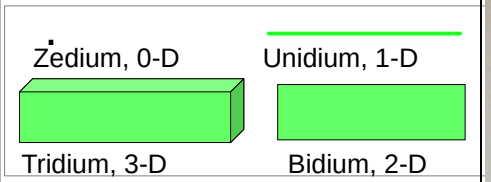
1. Initial state is no thing, no dimension, and zero assumptions.
2. All entities including dimensionality must be declared before used.
3. Assumptions must be declared.
4. Minimize assumptions, but no less than necessary, and no limit.
5. Definitions are word(s) substitutions.
6. Hypothesii can be either proven or dis-proven.
7. Theorems are provable within the model.
8. Conjectures have expectation of proof.
9. Opinions have no rigorous value.

2. The Dium Hypothesis of Natural Dimension

Definition 1: Axiom is an assumption.
Definition 2: Natural dimension is the dimension that is our reality, as opposed to artificial and/or abstract dimensions such as the Cartesian plane for the relation of arbitrary variables in equations.
Definition 3: Continuous – A region which is made entirely of one thing, not a collection of many discrete atomized things. The continuity is infinitely small, therefore not constrained by the principle of atomicity.

Axiom 1: Natural dimension exists as a continuous object.

Definition 4: dium is continuous natural dimension of any cardinality.
Definition 5: zedium is a 0-dimensional continuous point dium.
Definition 6: unidium is a 1-dimensional continuous linear dium.
Definition 7: bidium is a 2-dimensional continuous surface dium.
Definition 8: tridium is a 3-dimensional continuous volumetric dium.
Definition 9: quadium is a 4-dimensional continuous 4-D dium.
Definition 10: chronodium - the solid form of time, aka history.
Definition 11: chronolium - the dynamic form of time, aka future.
Definition 12: dium density - the amount of dium per region.



Definition 13: Universe is the union of all natural dimensions.

Axiom 2: Natural dimension can neither be created nor destroyed: it can only be transformed.

Axiom 3: Natural dimension is fundamental energy by existence, not by relation.

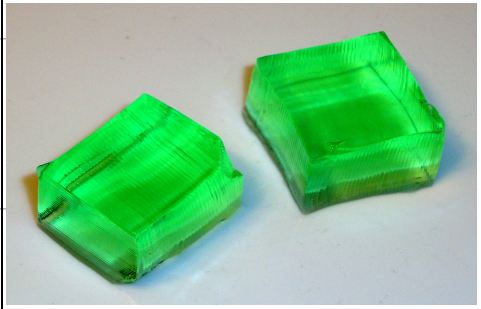
Axiom 4: Natural dimension is capable of phase property, and 3 phases: continuous, particulate and constant.

Definition 14 : Visco-elasticity of dium - A property of any dium where a subset of the dimensions region can deform in an elastic, flowing, and twist without necessarily causing the coordinate system within the dimension to also deform. The resistance to deformation is not caused by particle collisions as in matter fluids, because dium is a continuous object.

Sub Axiom 4.1. Continuous phase dium has three properties:
4.1.1. Elastic property gives rise to gravity.
4.1.2. Flowing loop property gives rise to magnetism.
4.1.3. Twist property gives rise to charge.

Sub Axiom 4.2. Particulate phase is a particle.
Sub Axiom 4.3. Constant phase is static dium, aka history.

Sub Axiom 4.4: Natural dimension in the elastic phase supports rotor and dimple waves.

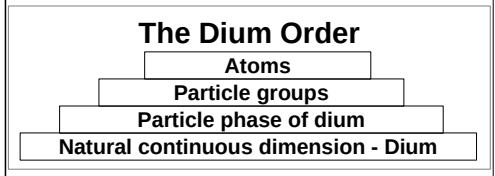


Gelatin cubes are an imperfect analogy to dium.

Definition 15: A rotor wave is a local twisting (torsion) oscillation of dium which then rebounds back in the opposite direction, then back, repeating endlessly without dissipation. A rotor wave can travel in a direction perpendicular to its axis of rotation. It is the dimension itself which is twisting.
Definition 16: An electromagnetic wave is a rotor wave.
Definition 17: A static rotor wave is a rotor wave which stops oscillating at a moment in the oscillation cycle. The region of space is left with a twist. This twist is called charge. The amount of twist is the amount of charge.
Definition 18: A dimple wave is an oscillating rebounding inward/outward compression of dium to higher/lower than surrounding density which then rebounds back, repeating endlessly without dissipation.
Definition 19: A static dimple wave is a dimple wave which stops oscillating at some moment in the oscillation cycle. If the oscillation stops at maximum compression then dium density is higher at the center and at a lesser density surrounding. The delta in density is called a warp in space-time, aka gravity. The higher compressed inner region is called "a particle".

Sub Axiom 4.5: All waves in dium are propagated solely as a property of the continuous dimension, not as particle collisions.

Definition 20: Nothing - no dimension nor time. Empty space is dium, not nothing.
Definition 21: Solidity - A region where particle or solid dium cannot be co-occupied.



Theorem 1: Natural dimension continues to exist when observers stop measuring it. [Certainty principle]

Proof: (Indirect method) If natural dimension ceased to exist, that would violate the conservation of natural dimension axiom.

Opinion 1: The preceding is intended to describe our known universe, as opposed to being only a theoretical model.

Hypothesis: Our 3-dimensional-spatial and temporal universe is composed of dium conforming to the axioms above.

3. The Mechanisms of 3 Fields

Gravitic attraction, **magnetic** attraction and repulsion, and **charge** attraction and repulsion, all have the common property of symmetry-seeking, thus reducing three unknowns to one unknown of symmetry seeking.

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Hypothesis: A particle with a dimple field is defined earlier has having mass. It is the distortion of the dium in its dimple wave that expresses the gravitational strength. Two+ particles have dimple fields that intersect, it is the fields themselves that attract each other, not the particles. The fields seek to achieve fully symmetric overlay centered on the dimple origin. This solves "action at a distance".

Hypothesis: The mechanism of magnetic attraction and repulsion: Magnetism is defined earlier as a loop flow of dium. When there are two magnetic fields near each other the loop flow vector field cannot flow through another loop flow magnetic field. Repulsion will occur when the vectors are opposing. The two magnetic fields attempt to achieve a fully symmetric overlay centered along the central axis of the flow. Opposite magnetic fields attract because this aligns the central axis of the flow. This solves "action at a distance".

Hypothesis: The mechanism of electric charge attraction and repulsion: The electric field was defined earlier as a static twist of the dium. The twist distortion of the dium can be visualized as a vector field. The twist is an in-equilibrium. Two equal but opposite charged/twist electric fields can create a symmetry only by canceling the twist by superimposing both twisted dium fields. The fields seek this symmetry state by opposites attracting. Same twist/charge fields repel because that decreases the symmetry. The exact shape of the twist is not provided here.

The three dium field properties above combined with dynamic and static temporal are a rich set of properties of the universe. These properties and/or combinations of these likely account for the Weak and Strong forces.

4. The Geometry of Dium

Theorem 2: The union of two or more diums of max cardinality N results in the same N ie; two lines are not a plane. Proof trivial.

Theorem 3: The intersection of two or more diums of max cardinality N results in the same max cardinality N. ie; ditto

5. The Nature of Time

Two competing models of time are presented with very different characteristics.

Axiom 5: Temporal change implies a delta in time from T0 to T1. If no time is present, there cannot be change.

Theorem 4: A static universe will always remain static.

Proof: Given a static universe which is the union of ALL dium, ANY introduction of delta time requires time to do that, conflicting with the prior assumption of static universe. You cannot find the time to introduce delta because it's all static as per the definition.

Type 1 Time: Container + Dynamic Now
1. Incorporates an extra chronolium and chronodium as a N+1 container dium for N-dium universe.
2. The NOW is the transition boundary and moves from history to future, partially analogous to a growing crystal.
3. The Arrow-of-time direction is well defined: past to future.
4 Time travel is not ruled out, but not guaranteed either.

Type 2 Time: Dynamic Now
1. Requires no higher-cardinality dium to function in a N-dium universe.
2. Is an intersection dium with the universe providing a morphing ability to effect change.
3. No room for a history store, nor a future store, just a dynamic now.
4. Where a spatial dium provides storage ability but no change, a Time dium provides for change ability for a spatial dium.
5. The Arrow-of-time is not well defined, only a transition.
6. Time travel is ruled out because of lack of time storage.

The Dynamic Now object is self-sufficient for time progression. This object seems to be distinct from the static storage of temporal history which any container dimension can provide. This object seems to be a second kind of object distinct from dium. This may require an addition to the Dium Order.

6. Origin of Mass and Inertia

1. A particle with mass is in an equilibrium state when it's at the center of its warp in space.
2. The gravity well of a particle is more than a side-effect of the mass of a particle: the gravity well is the origin of mass and inertial effects of the particle.
3. When a particle is struck by another particle, it moves non-smoothly out of its centered position into a state of dis-equilibrium. It is the dis-equilibrium of the gravity well that resists this non-smooth jolt, not the particle. Therefore, particles with no mass, and thus no gravity well, have no inertial resistance to acceleration. It is the adjusting of the gravity well around a particle which is the origin of inertia. This decouples mass from inertia.
4. When particles with mass collide among themselves repeatedly they cause particle acceleration. This kind of motion exhibits the inertial resistance to acceleration by the particle because **the particle collision is inducing the motion and causing dis-equilibrium with its warp of space**. Thus a space ship launches from the ground with considerable acceleration forces felt by astronauts.
5. When a particle's warp of space encounters another warp, the warped fields themselves, not the particle, induce the motion of the field. When such a field-induced motion occurs, the particle is brought along with **no inertial resistance to the acceleration**. Thus a space ship already orbiting earth is accelerating and has no inertial effects.

7. Predictions

1. A particle and its warp of space **need not always be together**. If a particle is detached from its warp of space, then the particle has no gravitational field, thus no mass, and therefore is not affected by gravity. Such a particle has spatial extents, boundaries, and maybe charge, but no mass.
2. Correspondingly, the separated warp in space now has no particle associated with it, but can continue to exist. Since it is the warp in space that is the effect of gravity, **the warp continues to exert gravity** and is affected by gravitational fields. Such a warp in space without an associated particle is an ideal candidate for the elusive "**Dark Matter**" phenomenon. This is not a black hole. It is gravity without a particle.
3. Concerning "**Dark Energy**" and the seemingly accelerating expansion of the universe, Axiom 3 defines dium as energy. It's trivial to see there is clearly enough energy to expand the universe, but no mechanism is provided here. Here the solution is split into two parts: mechanism and energy to drive the mechanism. We provide a solution for the latter, thus half ways there.
4. There is no limit to the size of a rotor wave. A standing rotor wave is possible and is highly undetectable until intersected with.
5. If two equal but opposite rotor waves were superimposed, the *effect* of this is to net cancel their effect. However, **the two super-imposed waves continue to exist**. This is a way of hiding and storing waves/energy.

8. Fields and Particles

Opinion: It may be possible that dium are where the important scientific study should be focused, instead of the current particle based research, even for the search for intelligent life. Ie; it's possible the non-particulate universe is where the important action is, the particles being mere flotsam.

9. Extra - Razor and Question

1. Patricks Razor - **Natural dimension XYZ+T cannot be denied existence without also removing the x, y, z and t variables from equations.** The Dium is what provides these variables in the first place.
2. Patricks Question - What is natural dimension made of?