

## **The Calculus of Distinctions: A Workable mathematicologic model across dimensions and consciousness<sup>1a</sup>**

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### **Abstract**

*The Calculus of Distinctions involves well-defined logical and mathematical operations involving the drawing of distinctions. The CoD formalizes the most basic concepts underlying all logic and mathematics. It deals with distinctions of content, extent and impact. It was first developed by Close in 1986, published in 1990, expanded to include dimensional notation by Close and Brandin in 2002, and has been further amplified by Close and Neppe since 2009. CoD defines and clarifies the most basic logical calculations involving distinctions. “Calculus” involves a system of operations, governed by a set of logical rules. The Calculus of Distinctions allows fundamental processes of calculation at a level of logic prior to applying any other mathematical rules: The CoD applies symbolic representation of a distinction or distinctions and extends into geometry and into multiple dimensions (“dimensionometry”), algebra, arithmetic and even to the calculus of Newton and Leibniz. It can be applied to any size of system, from the quantal to the astronomical, and recognizes the fundamental role of “consciousness”, namely the drawing of distinctions. For the purpose of calculation, CoD expressions are changed by one or more logical operations, consisting of one or more steps, to another form. It differs from Set Theory because it involves multiple dimensions, consciousness, is triadic (not binary), incorporates imaginary, complex and negative numbers, and involves distinctions not similarities. CoD fundamentally mathematically conceptualizes reality: The CoD distinguishes self from not-self by a conscious distinguisher; interprets reality by the perceptual, conceptual and experiential; and existentially differentiates extent, content and impact variables, and effectively represents dimensions, substance and influence, as well as allowing for interrelationships between them by “density”. “Consciousness” plays an enormous role in all aspects of scientific analysis through the application of the CoD. Ultimately, this translates into a new method for quantifying and representing multidimensional variables mathematically either interally or ordinally. The CoD is particularly relevant to the Neppe-Close Triadic Dimensional Distinction Vortical Paradigm (TDVP) model (or technically TDdVP). TDVP is a proposed so-called “theory of everything”. TDdVP describes the “Triad” of Space, Time, and Consciousness all being inseparably tied (“tethered”) together; TDVP involves carefully defined “dimensions” and requires spinning movements (Vortices). TDVP reflects a major paradigm shift that appears feasible in the broader sciences—the Physical, Psychological, Consciousness and Biological Sciences—and also results in a philosophical model called Unified Monism. Importantly, it applies the Calculus of Distinctions as a new mathematical technique, as part of its mathematical feasibility.*

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## What is the Calculus of Distinctions?

The Calculus of Distinctions (CoD) involves well-defined logical and mathematical operations involving the drawing of distinctions. The CoD constitutes the most basic concept underlying all logic and mathematics, applied to distinctions of content, extent and impact.

### *The Calculus of Distinctions (CoD): History*

The logic of the CoD was initially based on Dr. George Spencer Brown's 1969 *Laws of Form*<sup>2</sup> (LoF). CoD is a major extension of the LoF incorporating not only Dimensions, but Consciousness and adding a new notation and operations in a defined triadic context. Dr. Edward R. Close developed the early forms of the Calculus of Distinctions in his books *Infinite Continuity*<sup>3</sup> (1990) and in *Transcendental Physics*<sup>4</sup> (1997 and 2000). In 2002 and 2003, Close worked with Dr. Vladimir Brandin to develop a preliminary form of dimensional CoD<sup>4;5</sup>. The further development of CoD has been very significant and greatly expanded since 2010, where Dr Close was later assisted by Dr. Vernon Neppe.<sup>1;6-10</sup> They have applied it extensively in their large, detailed model "Triadic Dimensional Distinction Vortical Paradigm" (TDVP)<sup>6</sup>.

CoD can greatly simplify the mathematics of substrate algebra by dealing with vectors, tensors, (scalars) twistors, and vortices as multi-dimensional distinctions.<sup>1;7</sup> This makes the CoD especially effective for testing hypotheses.

Distinctions are used in this paper in the context of Close's Calculus of Distinctions (CoD). CoD applies the logic of Spencer Brown's Laws of Form, extended to dimensionality and consciousness. However, as indicated later, there are some similarities to Georg Cantor's Set Theory<sup>11</sup>, though CoD is far more versatile.

### *The Calculus of Distinctions (CoD): What is it?*

The "*Calculus of Distinctions*" is a system of logic dealing with distinctions which may be drawn in any number of dimensions. The CoD involves well-defined logical and mathematical operations involving the drawing of distinctions, constituting the most basic concept underlying all logic and mathematics. Particularly relevant to TDVP are distinctions of content, extent and impact.

This is the first formal paper on the Calculus of Distinctions. Others are anticipated<sup>1</sup>.

### *What is a Distinction?*

Distinctions are applied via *Close's Calculus of Distinctions (C of D)*. This can greatly simplify the mathematics of substrate algebra by dealing with vectors, tensors and scalars, as well as applying vortices, and a subgroup of these, twistors, as multi-dimensional distinctions.

This makes the C of D especially effective for testing scientific hypotheses.

Based on the definitions of the elements, the variables and realities below, there are three different conceptual qualities of distinctions:

- Distinguished, distinguished from, consciousness drawing *elements* (DFC)
- Impact, content and extent *variables* (ICE)
- Perceptual, conceptual, experiential (actualized) *realities* (PCE; or PCA)

### ***Elements of distinctions***

We need to distinguish something from everything else. It could be oneself from others with the boundary between being the psychological ego-boundary. It could be the top from the bottom of a line. In each instance, we need to distinguish the difference.

As indicated, the three necessary elements (abbreviated DFC) to produce a distinction are:

- that which is distinguished,
- that from which it is distinguished and
- that which draws the distinction.

### ***Variables of distinction***

Variables exhibit a range of varying values, as opposed to a specific, finite numerical value, and represent measures to define distinctions (contrast with mathematical constants).

Importantly, and critical for dimensionometry, are the variables in any meaningful existential reality. This distinction has at least three types of *variables*: variables of impact, content and extent (ICE).

Conceptually, we classify “impact”, at times, in the C-substrate. It may or may not exist on its own in the S and T substrates, although the impact from C-substrate may pervade the other two. In practice, “impact” would potentially be one way in which meaningful contextual information could be dimensionally represented, for example, by applying the concept of density through an “infinite guiding reality”. This could theoretically allow pure information to be converted to the C-substrate ordinal variables of extent, and might invoke theological postulates. However, it is likely that more commonly, the “impact” could reflect drive or intention or motivation, which may be applied mechanistically through psychological or neurological volitional mechanisms.

But although, “impact” could be one method of applying density, the simple physical force per unit conversion in 3S-1t is likely far more common: In that instance, without any consciously intentional “impact” applied, we can use the CoD concept of purely logical “content per unit extent”. In CoD, we have called this “density”.

### ***Calculus***

Why is the term “calculus” used in the Calculus of Distinctions? Most individuals think of Newtonian Calculus as the only kind of calculus, rather like we might refer to “Kleenex” for tissues. The calculus of Newton and Leibniz is sometimes called “*the calculus*” but is just one of the many possible calculi, in this instance, involving the *mathematical study of change* in a

macroscopic system. By comparison, Algebra involves the study of mathematical operations, Geometry of shape, and Trigonometry of angles. But more broadly, the term “Calculus” involves a system of operations, governed by a set of logical rules. The Calculus of Distinctions allows fundamental processes of calculation at a level of logic prior to applying any other mathematical rules: The CoD applies symbolic representation of a distinction or distinctions and extends into geometry and into multiple dimensions (“dimensionometry”), algebra, arithmetic and even to the calculus of Newton and Leibniz. It can be applied to any size of system, from the quantal to the astronomical, and recognizes the fundamental role of “consciousness”, namely the drawing of distinctions. For the purpose of calculation, CoD expressions are changed by one or more logical operations, consisting of one or more steps, to another form.

### ***Dimensions***

“*Dimensions*” are measured using variables of *extent*, such as Space, Time and Extent of Consciousness. The *contents* of an n-dimensional distinction are measured in units of content, such as mass and energy and Content of Consciousness. These units are not variables of extent (and hence mass and energy are not dimensions) because their measurement is independent of extent. Content can be incorporated with extent as units of content per unit of extent to express the strength or *density* of the distinction. “*Distinctions*” are the basis of all conceptualizations, perceptions, observations, measurements, and knowledge, and the calculus of distinctions is logically prior to enumeration and equivalence, the basis of all conventional mathematics. Because of this, the calculus of dimensional distinctions is a powerful tool used to evaluate and extend all mathematical procedures.

One way in which dimensions are conceptualized is the application of Close’s calculus of distinctions. Dimensions necessarily require variables of extent. Dimensions can be measured metrically ordinally in time and space, and ordinally in C-substrate applying extent variables and in the transfinite applying postulated hypercomplex ordinals. Dimensions can be conceptualized as distinctions of extent.

### ***Levels of Distinctions***

There are several levels of distinctions in CoD of pertinence to the TDVP model including:

- *Distinctions of existential reality*: Variables of Impact (Influence), Content and Extent (ICE)
- *Distinctions of interpretation*: Perceptual, conceptual, experiential (actualized) (PCE).
- *Distinctions of fundamental elements*: that which is distinguished; that which it is distinguished from; that consciousness that draws the distinction (DFC).

One related term is the Calculus of dimensional distinctions: (CodD): This is the CoD with extended notation and detailed operations applicable to finite n-dimensional distinctions.

### ***The CoD and TDVP***

The CoD is particularly relevant to the Neppe-Close Triadic Dimensional Distinction Vortical Paradigm (TDVP) model (or technically, TDdVP). TDVP is a proposed so-called

“theory of everything”. *TDdVP* describes the “*Triad*” of Space, Time, and Consciousness all being inseparably tied (“tethered”) together; TDVP involves carefully defined “dimensions”, and uses the Calculus of *Distinctions* as one of its new mathematical techniques. TDVP requires spinning movements (*Vortices*). It reflects a major paradigm shift that appears feasible mathematically, in the broader sciences such as the Physical, Psychological, Consciousness and Biological Sciences, and also results in a philosophical model called *Unified Monism*.

**Table 1: Clarifications of The Various Reality Existential Variables**

**Extent:** In CoD, extent involves variables of linear or curvilinear form measurable real, imaginary or complex numerical variables with values ranging from zero, discrete values to infinity, and from interval to ordinal. They can be finite, transfinite (quantized or discrete infinity) or infinite (reflecting continuous infinity) e.g. spatial, time and extent of consciousness.

**Content:** (in CoD) These are variables of content that that *quantify* the content of mass and energy and Consciousness content. They are measured indirectly only through “Content Density” (content/unit extent). Variables of content reflects “content” —what is contained, and not the “form of containment”. They can be descriptive e.g. a yellow rock; or a hard rock; or: the rock weighs 40kg, reflecting mass: Such measures are specific and concrete, and quantitative, compared with established standards. But, since they are independent of size or shape, they are measures of content not extent.

**Impact:** (CoD) Variables of process (previously called Variables of Intent; also Variables of Influence). This includes interactions of afferent information, central intent and efferent influence. Impact reflects deliberate or automatic “processes”, *not* content or extent.

Impact variables may be used to measure impacts of consciousness, but clearly also can measure the impact of space-time mass-energy events which impact S, T and C, e.g. an earthquake.

- CoD demonstrates a fundamental versatility and durability in the mathematical technique, and has many creative and unique facets. These are key elements:
- It reflects the most fundamental logical system for effectively analyzing the conscious experience of Reality.
- It allows applications across dimensional domains, recognizing the distinctions between our different kinds of experiences, and how the mathematics can be applied at different dimensional levels.
- It allows conceptualizing conscious awareness, differentiating our experience at the most fundamental of level, and ultimately reveals the relative nature of the hidden dimensional realities of existence.
- The CoD distinguishes “variables of extent, content and impact” (Table 1). These are applied to ensure that the dimensional, the substantial and the influences on events or objects are appropriately differentiated: consciousness is an important common element in all of these.
- It recognizes the key experiential roles of subjective “perceptions”, “conceptions” and “interpretations”: What to us is experience in everyday reality, may be quite different at, for example, the sixth and seventh dimensional domains.

- The CoD also allows for integrating the complex algebras and multidimensional geometries. These are most useful for describing elementary particles and processes, This is possibly its most practical use.

### **The Calculus of Distinctions and Set Theory**

The Calculus of Distinctions has a derivation from Spencer Brown's Calculus of Indications, but on the other hand it has some early parallels with Georg Cantor's Set Theory<sup>11</sup>, a great contributor in similar areas to ours. Set theory examines non-dimensional, non-consciousness *similarities*. But Set Theory did not fundamentally include imaginary numbers or negatives. CoD evaluates *differences*, including at the metadimensional extradimensional and transfinite levels, and relates to consciousness.

The conceptual relationships are extremely important in the context of the Calculus of Distinctions—there is great relevance to distinguishing percepts, concepts and experiences as well as subjectivity and relative objectivity.

CoD could, we posit, be further applied by metadimensional diagrammatic representations, and portraying the differentiation and integration potential of the shared, interfacing, and differing components of indivision windows. It would apply, too, to the top-down and bottom-up metadimensional models, by reflecting not only the static diagrams, but also geometrical forms, but also multiple dynamic representations of vectors, scalars and tensors and vortices. These speculations are linked closely, too, with the TDVP dimensionometric model and the method of dimensional extrapolation also developed by Close<sup>12 6; 10; 13 14</sup>.

An attempt to portray Space, Time and some kind of Consciousness on the Venn diagram of Set Theory (as attempted by Sirag)<sup>15</sup>, produces an incomplete portrayal: Set Theory involves a one on one binary model and is too limiting, since incorporating consciousness makes Reality triadic. It was not applied to multiple dimensions, just representing them in two dimensions.

The Calculus of Distinctions goes beyond what Set Theory does in that regard. Instead of just applying binary algebras, we utilize another basic element, expressed mathematically as imaginary and complex numbers.

- Distinctions differentiate three qualities via consciousness content and form.
- Unlike set theory, which examines linear binary similarities, distinctions examine differences across many dimensions—they can utilize a multidimensional approach.
- To qualify as a dimension, we apply Close's Calculus of Distinctions. Dimensions necessarily involve variables of extent (such as depth or linear time or an extent of consciousness) not of content (such as mass or energy, which can be related to extent by their density, defined as amount of content per volumetric unit of extent).
- Distinctions of Impact describe the afferent, central or efferent impact of any communication systems (e.g. conversation, non-verbal, psi, guided, none) with extent and content

distinctions. Amongst the psi communications is First Sight theory.

- Distinctions also differentiate the perceptual, conceptual and experiential.
- the calculus of distinctions involves a modification of classical Newtonian and Leibniz motion calculus to a multidimensional calculus of conscious forms and indications.

### **Calculus of distinctions and logic**

Consistent with the ultimate holistic nature of reality, the various fields of science, mathematics, and geometry should not be viewed as separate; they all arise from the intrinsic logic of the substrate of consciousness and are based in logic and the drawing of distinctions. Their axioms, theorems and proofs, when correct, are extensions of the primitive logic of distinctions underlying the perceptual aspects of the fundamental reality of the universe. The formal logical process involves the drawing of distinctions, called the Calculus of Distinctions<sup>4</sup>. From this integrated point of view, we are able to see the connection between the physical universe and human consciousness, and the connections between the infinite continuity of the substrate of transfinite consciousness and the finite distinctions of human consciousness, time space, energy and matter.

#### ***Reality distinctions***

As indicated, there are three ways to *differentiate* distinctions in *reality*, namely, Fundamental (DFC), Interpretation (PCE) and Reality Existential (ICE).

- *Fundamental distinctions:* (DFC) that that is distinguished, from what, with consciousness drawing the distinction).
- *Distinctions of interpretation:* Perceptual Distinction, Conceptual Distinction and Experiential (or Actualized) Distinction (PCE or PCA). The differentiation is subtle as distinctions occur in the context of reality.
- *Distinctions of existential reality:* When the substrate variables of extent are space, time and C-substrate, and of content are mass and energy and content consciousness, then the calculus of distinctions expression for the STC substrates are:

$$R = f(S, t, m, e, c, ) = \sum( [(m/S) \neg e/t] \neg c/St) \neg = \sum[ (ST) \neg C] \neg$$

Where R= all reality, S= 3Dspace, t= time, m= matter, e= energy, c= individualized consciousness and C= Primary Consciousness. <sup>1; 4; 7; 9; 16</sup>

Therefore, distinctions always have the three essential fundamental elements DFC; exhibit PCE reality differentiation; and have ICE as variables or FIRE (fundamental, interpretative, reality existential)

#### ***Combining these distinctions in physics:***

The matter and energy of the reality we experience is comprised of actual distinctions. These are made up of finite elementary actual distinctions, called quanta, which obey the laws of quantum mechanics. Quanta might reflect "elementary distinctions" only in the relevant S3-1t domain in which finite energy and mass is very important.

#### ***Distinctions and the Origin Event.***

If we think of the expanding universe as the reverse of a black hole, the point where quanta of matter and energy began to form at the end of the rapid-expansion period is analogous to the *event horizon* of a black hole. We are calling the first events at the outset of existence—the beginning (e.g., the big bang, theologians call it “creation”)—by a non-prejudicial term “*Origin Event*”. At that point, the phenomena that make up reality do not exist until they are registered in an irreversible way upon a “Primary Receptor or receptors”. But we refer to “Origin Event” only in the finite 3S-1t context, as it does not apply to use the term in the infinite context with concepts of metatime, or even at the higher dimensional finite levels.

## Distinctions of Existential Reality in CoD

***Distinctions of Extent:*** Distinctions of extent describe and measure space, time and consciousness. Therefore, they can be reflected as different dimensions because extent variables can metrically be measured either intervally or ordinally. Distinctions of content describe and measure mass, energy and information. For example, the distinction of extent reflecting a measure of space is paralleled by the distinctions of content reflected, for example, by mass. Mass-energy or force cannot be dimensions because they are not variables of extent: We use the term, force instead of energy here, so that potentially (and speculatively) we can apply the concept of content to consciousness (C-substrate).

***Distinctions of Content:*** Content can be related to extent in space only indirectly via an equation: Though the variables of mass and energy are measurable metrics, they represent distinctions of content, and not extent. However, they can also be measured metrically in space-time via the ratio of density. Density is the measure of the amount of mass, energy or information in a finite portion of a given STC domain, and is therefore, the mechanism to link distinctions of content to extent. Distinctions of content are related to extent through density—the amount of mass, energy or information per unit space, time or consciousness. Thus density is an indirect measure of content, determined mathematically, e.g., force per unit area, or mass per unit volume.

***Density:*** The relationship of extent and content is a relevant one. Logically, the best way to conceive of distinction possessing both content and extent is via density. Extent is reflected in dimensions. Content is conceptualized as “substance”: for example in 3-D space, content is essentially mass or energy. But mass and energy both have density (unit of substance per volume gives density, yielding weight and/or force) revealing the link between the two.

***Time:*** Time contents may reflect events that are more than two dimensional in time<sup>c</sup> because of the commonality of experience. Conceptually, this commonality is expressed by the 3 D vortical indivision fabric, which we postulate, would commonly have a component in C-substrate, and when discussing time dimensions, it would conceptually be a 3T time element, in

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<sup>c</sup> 2D Time would constitute a “time plane” as opposed to 1D Time being “linear time”. Could 3-D time then be conceptualized as a “time volume”?

this instance. Mathematically, we have demonstrated how logical it is to reflect both 3D time and 3D space. This allows for density measurements, necessarily as 3D experiences.

**Relative density** is the relative expression of content in extent. The operational definition is the amount of content per unit of metric extent. As examples, let us density of matter and flux density of energy in this context:

- density is defined as mass per unit volume, and therefore the mass of an object is its density times its total volume,
- flux density—the density of energy flow—whether the force of flowing water, or the force of a magnetic field, is defined as the force acting on a unit area. Therefore, the force acting on a given object affected by the energy is flux density of the field times the total projected area of the object perpendicular to the direction of the flux or energy flow.

Consequently, the flux density of a specific energy field is analogous to the mass density of a specific object, and the force exerted on a specific object by an energy field is analogous to the total mass of the object.

These are both examples of relative content density: Mass and energy are variables of content and they're related here to spatial extent, and they're both measurable.

At this point, we extend the idea of relative density to consciousness: The analogous unit would be *intensity* of the conscious quality. The extent of consciousness is ordinal — we can measure it as the “intensity”, but it is more than just intensity<sup>17</sup>: Intensity is the quantitative measure of conscious extent, but there is also a qualitative element. This reflects the different dimensions of consciousness. That quality difference reflects the number of dimensions, and the intensity reflects each dimensional ordinal component.

As we “ascend” the ladder in the hierarchy of dimensionality, Space, Time and Consciousness becomes more complex. These concepts may appear simple at the 3S-1t -1c level, but even there they are not so simple. This is so, as even there, the conventional tendency in our conventional physics is to ignore the role of Consciousness, just emphasizing Space and Time as 3S-1t. At the higher dimensional levels, the concepts of Space, Time and Consciousness are more dynamic, but Consciousness appears to be increasingly more pre-eminent, for example, at the transfinite levels, where though the Space and Time triad with Consciousness remains, we postulate that Space and Time are entirely embedded in Consciousness.

In the calculus of distinctions, density could be regarded as a boundary variable, the third component in a space-time, or time-consciousness distinction. We speculate here on the role of Impact, the third of the existential reality triad of content, extent and impact. For example, a guiding of reality content may convey an Impact from the C-substrate onto any of the content of mass and energy and the extent of space and time. We examine *Impact Density*: Impact density would be the specific boundary condition linking content with extent. Perhaps that boundary relative density component is the vehicle for *impact* described by certain impacting or influencing or intentional components of the CoD. This Impact Density might also apply for

content density where content is expressed per unit of extent.

Amplifying this analogy further, where *Impact* might well be the *functional* explanation of how events or objected are impacted upon, Impact Density might be the *mathematical mechanism* linking all three densities of existential reality content, extent and impact.

We could use *ordropy* as a complex example. We developed the term, Ordropy, to refer to the existence of spatial, temporal or other meaningful *multidimensional* order and patterns, in finite and infinite subrealities, including, but not limited to, negative entropy (“negative physical entropy of 3S-1t.”) which is only one component.<sup>17 10</sup>. Ordropy would exhibit components of functional impact and mechanical impact density on content and extent.

Density is, therefore, not only a spatial concept in terms of content and extent, but it also has a time concept, and a consciousness concept.

We are applying the CoD to quanta, which would more narrowly be space-time extent, mass-energy content. Therefore, translated across STC these are more correctly termed *qualits* reflecting the composite term for quisits (a general term for quanta of substance) in space, chronits of time and conscits of consciousness. Quisits, chronits and conscits may each have their own quark-like packets or particle-wave components so still are generic terms. Perceptual reality is quantized into finite discrete wave-particle-packet components of qualits.

We therefore, have different elements that are relevant packets or waves at the STC levels. If we kept quanta, we would have to describe this purely at the quantum physical level though quanta certainly may be quisits or sometimes chronits. If there are meaningful quanta in the Copenhagen sense, they are qualits and there may or may not be separate conscits as particle/ waves like psitrons or kinetrons.

### ***Distinctions of Impact***

Content and extent are fundamental aspects of distinctions. Distinctions are relevant in consciousness, and besides extent and content, there is the impact, which is quite different qualitatively.

It may be that impact could be applied as a theological concept for “guiding” or “guided” meaning. Impact, as portrayed theologically, could imply infinite guiding, but it could also neurologically derive from the finite, for example, working though physiology and the psychology of volition. Impact would then be perceived as mechanistic and include functionality. Whereas impact conveyed by vortical distinctions may be a mechanism or a functional way to produce content, the converse does not apply. The use of *Impact* may appear to be more controversial and less relevant than content and extent so an alternative term, which is more embracing, may be more useful and acceptable. Guidance, to some, may imply a Supreme Intelligence, but the concept of God is a philosophical construct; and belief is not an acceptable basis for scientific analysis.

### ***Relating CoD to Density Concepts***

All dimensions are expressed in terms of variables of extent in some form. However, distinctions of mass and energy are measurable in variables of content that do not directly indicate their extent (and hence one cannot use “degrees of freedom” in that regard) but we can calculate the dimensionometric extent of any given mass/energy distinction, if we know its density. The same applies to fundamental forces and vortices.

### **Perspective**

The Calculus of Distinctions is of extraordinary relevance and utility in the context of Multidimensional evaluations, Consciousness and in its differentiation of several existential features of extent, content and impact, and of distinctions of interpretation.

The versatility of the CoD allows descriptive models to be examined in the three or four dimensions even when greater multidimensionality is involved.

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