E=mc² = E=m : The Constants Illusion Exposed
Why Einstein's c-constant conceals the fundamental error
From Dynamic Ratios to the Constants Illusion

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Résumé

This work reveals the central point of Einstein's relativity theory : E=mc² is mathematically identical to E=m. The only difference lies in Einstein's treatment of c as a "constant" instead of a dynamic ratio. By fixing c = 299,792,458 m/s, the natural time-mass duality $T \cdot m = 1$ is artificially "frozen," leading to apparent complexity. The T0 theory shows : c is not a fundamental law of nature, but only a ratio that must be variable if time is variable. Einstein's error was not E=mc² itself, but the constant-setting of c.

Table des matières

1 The Central Thesis : E=mc² = E=m

> **The Fundamental Recognition**
>
> **E=mc² and E=m are mathematically identical !**
> The only difference : Einstein treats c as a "constant," although c is a dynamic ratio.
> **Einstein's error** : c = 299,792,458 m/s = constant
> **T0 truth** : c = L/T = variable ratio

1.1 The Mathematical Identity

In natural units :
$$E = mc^2 = m \times c^2 = m \times 1^2 = m \tag{1}$$

This is not an approximation - this is exactly the same equation !

1.2 What is c really ?

$$c = \frac{\text{Length}}{\text{Time}} = \frac{L}{T} \tag{2}$$

c is a ratio, not a natural constant !

2 Einstein's Fundamental Error : The Constant-Setting

2.1 The Act of Constant-Setting

Einstein set : $c = 299,792,458$ m/s = **constant**
What does this mean ?
$$c = \frac{L}{T} = \text{constant} \quad \Rightarrow \quad \frac{L}{T} = \text{fixed} \tag{3}$$

Implication : If L and T can vary, their **ratio** must remain constant.

2.2 The Problem of Time Variability

Einstein recognized himself : Time dilates !
$$t' = \gamma t \quad \text{(time is variable)} \tag{4}$$

But simultaneously he claimed :
$$c = \frac{L}{T} = \text{constant} \tag{5}$$

This is a logical contradiction !

2.3 The T0 Resolution

T0 insight : $T \cdot m = 1$
This means :
— Time T **must** be variable (coupled to mass)
— Therefore $c = L/T$ **cannot** be constant
— c is a **dynamic ratio**, not a constant

3 The Constants Illusion : How it Works

3.1 The Mechanism of the Illusion

Step 1 : Einstein sets c = constant

$$c = 299,792,458 \text{ m/s} = \text{fixed} \tag{6}$$

Step 2 : Time becomes "frozen" by this

$$T = \frac{L}{c} = \frac{L}{\text{constant}} = \text{apparently determined} \tag{7}$$

Step 3 : Time dilation becomes "mysterious effect"

$$t' = \gamma t \quad (\text{why}? \to \text{complicated relativity theory}) \tag{8}$$

3.2 What Really Happens (T0 View)

Reality : Time is naturally variable through $T \cdot m = 1$
Einstein's constant-setting "freezes" this natural variability artificially
Result : One needs complicated theory to repair the "frozen" dynamics

4 c as Ratio vs. c as Constant

4.1 c as Natural Ratio (T0)

$$c(x,t) = \frac{L(x,t)}{T(x,t)} \tag{9}$$

Properties :
— c varies with location and time
— c follows the time-mass duality
— No artificial constants
— Natural simplicity : $E = m$

4.2 c as Artificial Constant (Einstein)

$$c = 299,792,458 \text{ m/s} = \text{constant everywhere} \tag{10}$$

Problems :
— Contradiction to time dilation
— Artificial "freezing" of time dynamics
— Complicated repair mathematics needed
— Inflated formula : $E = mc^2$

5   The Time Dilation Paradox

5.1   Einstein's Contradiction Exposed

Einstein claims simultaneously :

$$c = \text{constant} \tag{11}$$

$$t' = \gamma t \quad \text{(time varies)} \tag{12}$$

But :

$$c = \frac{L}{T} \quad \text{and} \quad T \text{ varies} \quad \Rightarrow \quad c \text{ cannot be constant}\,! \tag{13}$$

5.2   Einstein's Hidden Solution

Einstein "solves" the contradiction through :
— Complicated Lorentz transformations
— Mathematical formalisms
— Space-time constructions
— **But the logical contradiction remains !**

5.3   T0's Natural Solution

No contradiction in T0 :

$$T \cdot m = 1 \quad \Rightarrow \quad \text{time is naturally variable} \tag{14}$$

$$c = \frac{L}{T} \quad \Rightarrow \quad \text{c is naturally variable} \tag{15}$$

No constant-setting → No contradictions → No complicated repair mathematics

6   The Mathematical Demonstration

6.1   From E=mc² to E=m

Starting equation : $E = mc^2$
c in natural units : $c = 1$
Substitution :

$$E = mc^2 = m \times 1^2 = m \tag{16}$$

Result : $E = m$

6.2   The Reverse Direction : From E=m to E=mc²

Starting equation : $E = m$
Artificial constant introduction : $c = 299,792,458$ m/s
Inflating the equation :

$$E = m = m \times 1 = m \times \frac{c^2}{c^2} = m \times c^2 \times \frac{1}{c^2} \tag{17}$$

If one defines c^2 as "conversion factor" :

$$E = mc^2 \tag{18}$$

This shows : $E = mc^2$ is only $E = m$ with **artificial inflation factor c^2** !

7   The Arbitrariness of Constant Choice : c or Time ?

7.1   Einstein's Arbitrary Decision

> **The Fundamental Choice Option**
>
> **One can choose what should be "constant" !**
> **Option 1 (Einstein's choice)** : c = constant → time becomes variable
> **Option 2 (alternative)** : time = constant → c becomes variable
> **Both describe the same physics !**

7.2   Option 1 : Einstein's c-constant

Einstein chose :

$$c = 299,792,458 \text{ m/s} = \text{constant (defined)} \tag{19}$$

$$t' = \gamma t \quad \text{(time becomes automatically variable)} \tag{20}$$

Language convention :

— "Speed of light is universally constant"

— "Time dilates in strong gravitational fields"

— "Clocks run slower at high velocities"

7.3   Option 2 : Time-constant (Einstein could have chosen)

Alternative choice :

$$t = \text{constant (defined)} \tag{21}$$

$$c(x,t) = \frac{L(x,t)}{t} = \text{variable} \tag{22}$$

Alternative language convention :

— "Time flows equally everywhere"

— "Speed of light varies with location"

— "Light becomes slower in strong gravitational fields"

7.4   Mathematical Equivalence of Both Options

Both descriptions are mathematically identical :

Phenomenon	Einstein view	Time-constant view
Gravitation	Time slows down	Light slows down
Velocity	Time dilation	c-variation
GPS correction	"Clocks run differently"	"c is different"
Measurements	Same numbers	Same numbers

TABLE 1 – Two views, identical physics

7.5   Why Einstein Chose Option 1

Historical reasons for Einstein's decision :

— **Michelson-Morley** : c seemed locally constant

— **Aesthetics** : "Universal constant" sounded elegant

— **Tradition** : Newtonian constant physics

— **Conceivability** : c-constancy easier to imagine than time constancy

— **Authority effect** : Einstein's prestige fixed this choice

But it was only a convention, not a natural law !

7.6   T0's Overcoming of Both Options

T0 shows : Both choices are arbitrary !

$$T \cdot m = 1 \quad \text{(natural duality without constant constraint)} \tag{23}$$

T0 insight :

— **Neither** c nor time are "really" constant

— **Both** are aspects of the same $T \cdot m$ dynamics

— **Constancy** is only definition convention

— **E = m** is the constant-free truth

7.7   Liberation from Constant Constraint

Instead of choosing between :

— c constant, time variable (Einstein)

— Time constant, c variable (alternative)

T0 chooses :

— **Both dynamically coupled** via $T \cdot m = 1$

— **No arbitrary fixations**

— **Natural ratios** instead of artificial constants

8 The Reference Point Revolution : Earth → Sun → Nature

8.1 The Reference Point Analogy : Geocentric → Heliocentric → T0

> **The Reference Point Revolution : From Earth → Sun → Nature**
>
> **Geocentric (Ptolemy)** : Earth at center
> - Complicated epicycles needed
> - Works, but artificially complicated
>
> **Heliocentric (Copernicus)** : Sun at center
> - Simple ellipses
> - Much more elegant and simple
>
> **T0-centric** : Natural ratios at center
> - $T \cdot m = 1$ (natural reference point)
> - Even more elegant : $E = m$

Einstein's c-constant corresponds to the geocentric system :
— **Human** reference point at center (like Earth at center)
— **Complicated** mathematics needed (like epicycles)
— **Works** locally, but artificially inflated

T0's natural ratios correspond to the heliocentric system :
— **Natural** reference point at center (like Sun at center)
— **Simple** mathematics (like ellipses)
— **Universally** valid and elegant

8.2 Why We Need Reference Points

Reference points are necessary and natural :
— **For measurements** : We need standards for comparison
— **For communication** : Common basis for exchange
— **For technology** : Practical applications require units
— **For science** : Reproducible experiments need standards

The question is not WHETHER, but WHICH reference point :

System	Reference Point	Complexity	Elegance
Geocentric	Earth	Epicycles	Low
Heliocentric	Sun	Ellipses	High
Einstein	c-constant	Relativity theory	Medium
T0	$T \cdot m = 1$	$E = m$	Maximum

TABLE 2 – Reference point systems comparison

8.3   The Right vs. Wrong Reference Point

Einstein's error was not to choose a reference point :

— **But to choose the wrong reference point !**

Wrong reference point (Einstein) : c = 299,792,458 m/s = constant

— Based on human definition

— Leads to complicated mathematics

— Creates logical contradictions

Right reference point (T0) : $T \cdot m = 1$

— Based on natural ratio

— Leads to simple mathematics : $E = m$

— No contradictions, pure elegance

9   When Something Becomes "Constant"

9.1   The Fundamental Reference Point Problem

> **The Reference Point Illusion**
>
> **Something only becomes "constant" when we define a reference point !**
> **Without reference point** : All ratios are relative and dynamic
> **With reference point** : One ratio becomes artificially "fixed"
> **Einstein's error** : He defined an absolute reference point for c

9.2   The Natural Stage : Everything is Relative

Before any reference point definition :

$$c_1 = \frac{L_1}{T_1} \tag{24}$$

$$c_2 = \frac{L_2}{T_2} \tag{25}$$

$$c_3 = \frac{L_3}{T_3} \tag{26}$$

$$\vdots \tag{27}$$

All c-values are relative to each other. None is "constant".

9.3   The Moment of Reference Point Setting

Einstein's fatal step :

$$\text{"I define : } c = 299,792,458 \text{ m/s} = \text{reference point"} \tag{28}$$

What happens at this moment :

— An **arbitrary reference point** is set

— All other c-values are measured relative to this

— The **dynamic ratio** becomes a "constant"

— The **natural relativity** is artificially "frozen"

9.4   The Reference Point Problematic

Every reference point is arbitrary :

— Why 299,792,458 m/s and not 300,000,000 m/s ?

— Why in m/s and not in other units ?

— Why measured on Earth and not in space ?

— Why at this time and not at another ?

9.5   T0's Reference Point-Free Physics

T0 eliminates all reference points :

$$T \cdot m = 1 \quad \text{(universal relation without reference point)} \tag{29}$$

— No arbitrary fixations

— All ratios remain dynamic

— Natural relativity is preserved

— Fundamental simplicity : $E = m$

9.6   Example : The Meter Definition

Historical development of meter definition :

1. **1793** : 1 meter = 1/10,000,000 of Earth meridian (Earth reference point)
2. **1889** : 1 meter = prototype meter in Paris (object reference point)
3. **1960** : 1 meter = 1,650,763.73 wavelengths of krypton-86 (atom reference point)
4. **1983** : 1 meter = distance light travels in 1/299,792,458 s (c reference point)

What does this show ?

— Each definition is **human arbitrariness**

— The **reference point** changes with human technology

— There is **no "natural" length unit** - only human agreements

— **Humans make c "constant" by definition** - not nature !

9.7   The Circular Error : Humans Define Their Own "Constants"

In 1983 humans defined :

$$1 \text{ meter} = \frac{1}{299,792,458} \times c \times 1 \text{ second} \tag{30}$$

This makes c automatically "constant" - through human definition, not through natural law :

$$c = \frac{299,792,458 \text{ meters}}{1 \text{ second}} = 299,792,458 \text{ m/s} \tag{31}$$

Circular reasoning : Humans define c as constant and then "measure" a constant !
Nature is not asked in this process !

9.8   T0's Resolution of the Reference Point Illusion

T0 recognizes :

— **Definition $\neq$ natural law**

— **Measurement reference point $\neq$ physical constant**

— **Practical agreement $\neq$ fundamental truth**

T0 solution :

$$\text{For measurements} : \quad \text{Use practical reference points} \tag{32}$$
$$\text{For natural laws} : \quad \text{Use reference point-free relations} \tag{33}$$

10   Why c-Constancy is Not Provable

10.1   The Fundamental Measurement Problem

To measure c, we need :

$$c = \frac{L}{T} \tag{34}$$

But : We measure L and T with **the same physical processes** that depend on c !
Circular problem :

— Light measures distances $\to$ c determines L

— Atomic clocks use EM transitions $\to$ c influences T

— Then we measure c = L/T $\to$ **We measure c with c !**

10.2   The Gauge Definition Problem

Since 1983 : 1 meter = distance light travels in 1/299,792,458 s

$$c = 299,792,458 \text{ m/s} \quad (\text{not measured, but defined !}) \tag{35}$$

One cannot "prove" what one has defined !

10.3   The Systematic Compensation Problem

If c varies, ALL measuring devices vary equally :

— **Laser interferometers** : use light (c-dependent)

— **Atomic clocks** : use EM transitions (c-dependent)

— **Electronics** : uses EM signals (c-dependent)

Result : All devices **automatically compensate** the c-variation !

10.4   The Burden of Proof Problem

Scientifically correct :

— One **cannot prove** that something is constant

— One can only show that it **appears constant within measurement precision**

— **Each new precision level** could show variation

Einstein's "c-constancy" was belief, not proof !

10.5   T0 Prediction for Precise Measurements

T0 predicts : At highest precision one will find :

$$c(x,t) = c_0 \left(1 + \xi \times \frac{T(x,t) - T_0}{T_0} \right) \tag{36}$$

with $\xi = 1.33 \times 10^{-4}$ (T0 parameter)
c varies tiny ($\sim 10^{-15}$), but measurable in principle !

11   Ontological Consideration : Calculations as Constructs

11.1   The Fundamental Epistemological Limit

> **Ontological Truth**
>
> **All calculations are human constructs !**
> They can **at best** give a certain idea of reality.
> **That calculations are internally consistent proves little** about actual reality.
> **Mathematical consistency $\neq$ ontological truth**

11.2   Einstein's Construct vs. T0's Construct

Both are human thought structures :
Einstein's construct :

— E = mc² (mathematically consistent)

— Relativity theory (internally coherent)

— 10 field equations (work computationally)

— **But** : Based on arbitrary c-constant setting

T0's construct :

— E = m (mathematically simpler)

— T · m = 1 (internally coherent)

— $\partial^2 E = 0$ (works computationally)

— **But** : Also only a human thought model

11.3   The Ontological Relativity

What is "really" real ?

— **Einstein's space-time** ? (construct)

— **T0's energy field** ? (construct)

— **Newton's absolute time** ? (construct)

— **Quantum mechanics' probabilities** ? (construct)

All are human interpretive frameworks of the inaccessible reality !

11.4   Why T0 is Still "Better"

Not because of "absolute truth," but because of :
1. Simplicity (Occam's Razor) :

— $E = m$ is simpler than $E = mc^2$

— One equation is simpler than 10 equations

— Fewer arbitrary assumptions

2. Consistency :

— No logical contradictions (like Einstein's)

— No constant arbitrariness

— Unified thought structure

3. Predictive power :

— Testable predictions

— Fewer free parameters

— Clearer experimental distinction

4. Aesthetics :

— Mathematical elegance

— Conceptual clarity

— Unity

11.5   The Epistemological Humility

T0 does NOT claim to be "absolute truth."
T0 only says :

— "Here is a **simpler** construct"

— "With **fewer** arbitrary assumptions"

— "That is **more consistent** than Einstein's construct"

— "And makes **more testable** predictions"

But ultimately T0 also remains a human thought structure !

11.6   The Pragmatic Consequence

Since all theories are constructs :
Evaluation criteria are :

1. **Simplicity** (fewer assumptions)

2. **Consistency** (no contradictions)

3. **Predictive power** (testable consequences)

4. **Elegance** (aesthetic criteria)

5. **Unity** (fewer separate domains)

By all these criteria T0 is "better" than Einstein - but not "absolutely true".

11.7   The Ontological Humility

The deepest insight :
— **Reality itself** is inaccessible
— **All theories** are human constructs
— **Mathematical consistency** proves no ontological truth
— **The best** we have : **Simpler, more consistent constructs**

Einstein's error was not only the c-constant setting, but also the claim to absolute truth of his mathematical constructs.

T0's advantage is not absolute truth, but relative superiority as a thought model.

12   The Practical Consequences

12.1   Why E=mc² "Works"

E=mc² works because :
— It is mathematically identical to $E = m$
— c^2 compensates the "frozen" time dynamics
— The T0 truth is unconsciously contained
— Local approximations usually suffice

12.2   When E=mc² Fails

The constants illusion breaks down at :
— Very precise measurements
— Extreme conditions (high energies/masses)
— Cosmological scales
— Quantum gravity

12.3   T0's Universal Validity

E = m is valid everywhere and always :
— No approximations needed
— No constant assumptions
— Universal applicability
— Fundamental simplicity

13   The Correction of Physics History

13.1   Einstein's True Achievement

Einstein's actual discovery was :

$$E = m \quad \text{(in natural form)} \tag{37}$$

His error was :

$$E = mc^2 \quad \text{(with artificial constant inflation)} \tag{38}$$

13.2   The Historical Irony

> **The Great Irony**
>
> Einstein discovered the fundamental simplicity $E = m$,
> but **hid it behind the constants illusion $E = mc^2$!**
> The physics world celebrated the complicated form and overlooked the simple truth.

14   The T0 Perspective : c as Living Ratio

14.1   c as Expression of Time-Mass Duality

In T0 theory :
$$c(x,t) = f\left(\frac{L(x,t)}{T(x,t)}\right) = f\left(\frac{L(x,t) \cdot m(x,t)}{1}\right) \tag{39}$$

since $T \cdot m = 1$.
c becomes an expression of the fundamental time-mass duality !

14.2   The Dynamic Speed of Light

T0 prediction :
$$c(x,t) = c_0\sqrt{1 + \xi\frac{m(x,t) - m_0}{m_0}} \tag{40}$$

Light moves faster in more massive regions !
(Tiny effect, but measurable in principle)

15   Experimental Tests of c-Variability

15.1   Proposed Experiments

Test 1 - Gravitational dependence :
— Measure c in different gravitational fields
— T0 prediction : c varies with $\sim \xi \times \Delta\Phi_{\text{grav}}$

Test 2 - Cosmological variation :
— Measure c over cosmological time periods
— T0 prediction : c changes with universe expansion

Test 3 - High-energy physics :
— Measure c in particle accelerators at highest energies
— T0 prediction : Tiny deviations at $E \sim \text{TeV}$

Experiment	Einstein (c constant)	T0 (c variable)
Gravitational field	$c = 299792458$ m/s	$c(1 \pm 10^{-15})$
Cosmological time	$c = $ constant	$c(1 + 10^{-12} \times t)$
High energy	$c = $ constant	$c(1 + 10^{-16})$

TABLE 3 – Predicted c-variations

15.2 Expected Results

16 Conclusions

16.1 The Central Recognition

> **The Fundamental Truth**
>
> **E=mc² = E=m**
> Einstein's "constant" c is in truth a variable ratio.
> The constant-setting was Einstein's fundamental error.
> T0 corrects this error by returning to natural variability.

16.2 Physics After the Constants Illusion

The future of physics :

— No artificial constants

— Dynamic ratios everywhere

— Living, variable natural laws

— Fundamental simplicity : $E = m$

16.3 Einstein's Corrected Legacy

Einstein's true discovery : $E = m$ (energy-mass identity)
Einstein's error : Constant-setting of c
T0's correction : Return to natural form $E = m$
Einstein was brilliant - he just stopped one step too early !

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