

# How the Epicureans might have predicted Lorentz time dilation

**Post by “jcblackmon” of December 15, 2025 at 10:05 AM**

Hi, everyone. I've argued that if, as Epicurus held, in some frame of reference all the most fundamental particles of which all other things are composed move at the same speed (his doctrine of isotacheia, also *isotakheia*), and if that speed is  $c$ , then Lorentz time dilation follows as a matter of classical kinematics, or just geometry. In short, the Epicureans should have expected Rossi-Hall (1940) and other such results.

On the isotacheian model, there are no abstract or mysterious interpretations of the values of the Lorentz transformation (by which we calculate time dilation); each value has a concrete physical interpretation as a velocity vector magnitude. I believe this model may be empirically equivalent to our standard Einsteinian theory of relativity, but it is classical, algebraically simple, and arguably more intuitive. It does not explicitly rely on (nor does it deny) the invariance of the speed of light or on Maxwell's equations or on any empirical discoveries; it just follows from isotacheia and a simple theorem of kinematics.

Here is my article: [https://www.researchgate.net/publication/39...f\\_Time\\_Dilation](https://www.researchgate.net/publication/39...f_Time_Dilation)

Although the journal is dedicated to ancient philosophy, I requested and received a specialist in relativity as one of my anonymous referees.

I may post a simple version of my argument, if there is interest. Thank you.

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**Post by “Cassius” of December 15, 2025 at 12:58 PM**

JC this is going to be over my own head and I suspect many of our readers, but I absolutely do hope you will add your simplified version and keep posting about it even if responses are slow.

We very much need to step up our game on physics and any posts you have on anything that relates to Epicurean theory will be appreciated.

And not only your current thoughts but also how you got interested and your development of thoughts along the way.

## Post by “Eikadistes” of December 15, 2025 at 4:31 PM

[Quote from jblackmon](#)

I may post a simple version of my argument, if there is interest. Thank you.

Please do!

While none of the Hellenists predicted the wide spectrum of discoveries that the 20th-century uniquely hosted, Epíkouros seems to me to have anticipated more of the contemporary nuances than any other philosopher. One, subtle example I like to use is the question of the "Center of the Universe". Most of us believe that the Heliocentric model is the correct model ... for the Solar System. But at the time, we weren't modeling the Solar System. We were modeling **all** of the stars, and we put the Sun in the very middle of all of them. *Heliocentrism* in this regard is false. To my knowledge, only Epíkouros shared the subtle insight that, indeed, "there can be no center to infinity."

I have always seen there to be some level of a conceptual correspondence between *isotakheia* and Einstein's propositions about the nature and propagation of light, so I would **love** a general outline of some of these advanced topics in contemporary physics and mathematics.

Also, are you familiar with Einstein's introduction to Diel's German version of *De Rerum Natura*? His commentary makes me wonder if he found direct inspiration from Epicureans. Per Einstein:

*"The work of Lucretius will work its magic on anyone who does not completely wrap himself in the spirit of our time and, in particular, occasionally feels like a spectator of the intellectual attitude of his contemporaries. One sees here how an independent man equipped with lively senses and reasoning, endowed with scientific and speculative curiosity, a man who has not even the faintest notion of the results of today's science that we are taught in childhood, before we can consciously, much less critically, confront them, imagines the world.*

*The firm confidence that Lucretius, as a faithful disciple of Democritus and Epicurus, places in the intelligibility, in other words, in the casual connectedness of everything that happens in the world, must make a profound impression. He is firmly convinced, he even believes he can prove, that everything is based on the the regular motion of immutable atoms, ascribing to atoms no qualities other than geometric-mechanical ones. The sensual qualities warmth, coldness, color, odor, taste, are to be attributed to the movements of atoms, likewise all phenomena of life. He conceives of the soul and mind as formed from especially light atoms, by assigning (in an inconsistent way) particular qualities of matter to particular characteristics of experience.*

*He states as the primary objective of his work the liberation of humanity from the slavish fear, induced by religion and superstition, that he sees as nourished and exploited by priests for their own purposes. This certainly is a serious issue for him. Nonetheless, he does seem to have been guided mostly by the need to persuade his readers of the necessity for the atomistic-mechanical worldview, although he dare not say this openly to his much more practically oriented Roman readers. His reverence for Epicurus, Greek culture and language, which he considers greatly superior to Latin culture and language, is altogether moving. It redounds to the glory of the Romans that this could be said to them. Where is the modern nation that holds and expresses such noble sentiments with regard to one of its contemporary nations?*

*Diels's verses read so naturally that one forget it is a translation."*

(**Einstein**, forward to: T. Lucretius Carus, *De rerum natura*, Vol. 2, *Lukrez, Von der Natur*, trans. by Hermann Diels, Berlin: Weidmannsche Buchhandlung, 1924, pp. via-vib)

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### **Post by "Martin" of December 16, 2025 at 8:45 AM**

I am halfway through with reading the publication and do not yet know by when I will finish and provide a more detailed reply.

I send this quickly in advance just in case there is a follow-up publication in the works: Please hold back or correct a mistake in the derivation:

After the correct equation  $b = \sqrt{s^2 - a^2}$ , a factor  $s$  is missing, which carries through in the subsequent equations.

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### **Post by "jblackmon" of December 16, 2025 at 8:58 AM**

Thank you, Cassius and Eikadistes. I love this quote of Einstein's which I did not know about.

I grasped the idea when I was taking Philosophy of Space and Time taught by Jeff Barrett at UCI back in the 20th century. As an English student at the time, I did not have the training to share the idea with STEM people who weren't willing to be patient or imaginative. Fortunately, some were, and I pursued it. At one point, I became convinced that the idea conflicted with our empirical data, so I reluctantly abandoned it for many years. I later realized I was wrong. (Thank you, Internet.) The idea, so far as I can tell (and based on communication with physicists, some of whom are experts in relativity), does not contradict our empirical knowledge--and it better not, because it's a theorem of kinematics.

The idea is that if the most fundamental parts of composite systems must all move (in some frame R) constantly at some speed  $s$ , then the greater that composite system's speed is (in R), the slower its parts can move relative to each other, and thus the slower it can change state--the slower it can age or evolve. (I can address why we should take the IF part seriously in another post.) I call such systems isotacheian, and it's simply a theorem of kinematics that isotacheian systems exhibit what we call time dilation in accordance with the Lorentz transformation (which has a simple Pythagorean form that is rarely seen for some reason).

One intuitive way to see this is to imagine a fleet of cars that all must always drive at say 50 mph. The fleet is an isotacheian system. If the fleet is to stay local, then each car must drive in tight loops. That fleet will typically be vacillating as its parts (cars) move relative to each other, but it as a composite system won't wander off. If instead the fleet is to travel somewhere, then the cars must devote more of their motion to moving in the same direction. Now the fastest this fleet can go is 50 mph, in which case the cars cannot move relative to each other at all. They will all be driving along parallel paths at 50 mph and so not getting closer to or farther from each other. The fleet then as a composite system will not be changing, though it will be in motion. Between these two limits for the speed of this fleet (0 mph and 50 mph) are other speeds and their corresponding rates of change. The relation is Lorentzian. The same holds for an isotacheian swarm of bees, school of fish, physical object composed of Epicurean atoms, or physical object composed of fundamental point particles.

I think special relativity doesn't have to be cloaked in mysterious abstractions and sophisticated math. An Epicurean could have worked this out using only the Pythagorean theorem. Honestly, I wouldn't be surprised to learn that one of them did.

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### **Post by “jcblackmon” of December 16, 2025 at 9:29 AM**

Thank you, Martin, and forgive me; I came to this as an outsider, not a physicist or math person. I perhaps did not make clear that I was normalizing, and so  $s = 1$ . Yes, unless there is a deeper problem (if so, please tell me), I will clarify this normalization in any subsequent publication.

I've shared this with many STEM folks, and interestingly you are the first to point this out.

Do you think my explanation works?

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### **Post by “Martin” of December 16, 2025 at 9:44 AM**

As speed has a unit, the normalization would need to be a bit more elaborate than just equating  $s$  with 1. One way to normalize would be to divide  $b$  by  $s$  but that might require adapting some of the text. I found no mistake in the text so far, but as mentioned, I need more time to finish.

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### **Post by “jcblackmon” of December 16, 2025 at 12:41 PM**

I see. I was thinking of measuring speeds in units of  $s$ . I should have been more clear and will try to be from here on out. Thank you!

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### **Post by “jcblackmon” of January 15, 2026 at 7:07 AM**

Hi Martin. Thanks for your valuable feedback. You wrote that you needed more time to finish reading the paper. I'd be very interested in your final thoughts. I'd also appreciate any advice you might have on addressing the normalization issue. It seems to me there are two ways of doing it, but I didn't think many other members would be interested in following us into the weeds on that! You are welcome to write to me directly.

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### **Post by “Cassius” of January 15, 2026 at 9:04 AM**

JC, FWIW, I happen to be aware that Martin is traveling this week and likely away from internet access so if he is delayed in responding that may well be a factor.

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### **Post by “Martin” of January 20, 2026 at 9:37 AM**

Whereas the analogy with the Lorentz transform is valid, the math and some other details might need further correction. I expect to dedicate some time slots with sufficient ability to concentrate to figure this out soon. Depending on what I come up with, I will write it here or in a private message. Regarding the normalization and Entailment 2 (where I got stuck the last time

I worked on the paper), a video call might be good. (Teams or Zoom work well for me).

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**Post by “jcblackmon” of February 4, 2026 at 7:49 AM**

Hi Martin. I look forward to hearing your thoughts. I do plan to propose the isotacheian model as an alternative way of teaching special relativity. I don't know how we direct message here.

And thank you Cassius for your message.

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**Post by “Martin” of February 4, 2026 at 11:21 AM**

I started a conversation between us.

For now, I see the isotacheian model as something complementary, e.g. as an exercise for students, but not as an alternative way of teaching special relativity.