
Physics World is looking for funny, off-beat and thought-provoking articles for the “Lateral Thoughts” section of the magazine. Articles in this section can cover any topic under the Sun, as long as it appeals to physicists.

We will award £100 to the best entry and £100 to the best article by a student. Entries, which must be 900-950 words long, can be e-mailed to pwld@iop.org by 31 May 2007 – so start thinking laterally.

21 May 2007

Dr Martin Griffiths
Reviews and Careers Editor
Physics World
IOP Publishing
Bristol BS1 6BE

Dear Dr Griffiths,
Lateral Thoughts

Thank you for your e-mail of the 9th in response to my preliminary submission of the 7th. Hoping the word count and the offer to readers therein are permissible, I am sending herewith my final submission. The small revisions made here, in four places, are given in red. (You may, of course, edit the script further to suit your columns.)

Again, if the offer to readers has your kind approval, the US\$25,000 (or its £ equivalent) can be transferred to an IOP account before publication of article. These can be on any terms you stipulate. (My homepage item on the offer will then be accordingly revised.)

Finally, to make the refutation seem less daunting, the contending reader may simply show, to your sole satisfaction, that – in keeping with Einstein's thinking, the moving body suffers no transverse contraction. This would suffice to debunk my entire thinking on the fundamental nature of things.

Thank you and best regards,
Sincerely,
Eugene Sittampalam

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Lateral Thoughts

Eugene Sittampalam

What coincidence! This article concerns a literally lateral, or physically transverse, aspect of a concept that many of us have come to accept as sacred for over a century now.

What thus seems a well-enshrined theory, Einstein's Special Theory of Relativity (1), is now seen to be coming apart at the sides – that is, literally laterally – and irreparably so.

Without further ado, consider the following in the simple world of our everyday experience – and in the light of observations that have increased by leaps and bounds since the 1905 theory.

- Mass and energy are not only equivalent but the two classical concepts – “mass” and “energy” – are fundamentally one and the same. Let us call this singular physical concept – “mass-energy”.
- Classical matter, basically, the atom, is thus the condensed form of mass-energy (vibrant at sub- c speeds); and classical energy, basically, electromagnetic radiation, is the evaporated state (at escape speed c).
- Condensation (inhalation) and evaporation (exhalation) of mass-energy take place at every level of the atom (or molecule) even in its so-called unexcited (ground) state; and the frequency of this exchange (breathing) corresponds to the natural vibration (characteristic) of the level.
- THE ATOM IS THUS A BREATHING ENTITY. [This breathing is the springboard of the quantum mechanics that would now lead to the long-sought unification of physics. The breathing keeps the atom in constant communion with all other atoms whether they be separated by ångströms or light years across the mass-energy field of the classical vacuum – making “locality” fundamentally baseless and labels such as “counterintuitive” and “weird” inappropriate to this real world of quantum mechanics (2).]
- The space and time of the Cosmic Background Radiation (CBR) serve us as absolute space and absolute time, respectively, of classical mechanics. The frame of the CBR is thus the preferred inertial frame of reference in our universe (3).
- Exhalation (over a half cycle) at an atomic level takes place when the vibrational amplitude of the level increases beyond a critical radial point and a mass-energy quantum attains speed c – in absolute space – and evaporates off into the vacuum. Inhalation (over the following half cycle) takes place when the vibrational amplitude at the level decreases below the critical point and a quantum of mass-energy of the immediate vacuum field loses speed c and condenses in. And the cycle repeats.
- Under motion, at v , the atom is thrust against the vacuum field. Caught between the impelling force and the resistive vacuum, the atom is flattened along its travel line, fore and aft and at every level down to the nucleus. And this counteraction of the vacuum to body motion is what we now call – **inertial resistance**.
- The squeeze results in net mass-energy (matter) loss for the atom, as in a squashed orange, the loss occurring over the breathing cycles during acceleration, that is, by exhalations exceeding inhalations; and this net output, which occurs across the efflux-conductive rear, is the ultimate cause of body acceleration. [Under acceleration, the contraction, and hence the vacuum resistance contributing to the contraction, would

increase; the latter is interpreted today as due to increase in the body's "inertial mass" (1).]

- Under deceleration, the atom is thrust back against the vacuum; and the counteraction of the vacuum here to loss of body speed is – the one that keeps also the thrown stone in motion – **inertial drive**.
- Deceleration relaxes body squeeze and the atom gains weight, by excess inhalation; and this net intake, which occurs across the influx-conductive front, is the ultimate cause of body deceleration.
- Just as importantly – the atom's *transverse* dimensions, too, suffer as a consequence of motion. Along transverse cross-sections, the radial levels attain c sooner – due to the vector v contributing to the absolute speed of vibration here as well. The transverse dimensions, too, thus contract at every atomic level. And, in curvilinear motion, the transversely contracting force being not equal all around (due to non-uniformity of speed **at** cross-sectional points) is the result of the impelling – **centripetal force**; and its vacuum counteraction – **the centrifugal force**.
- Mass of the atom is thus not absolute but dependent on the environment. For example, at triple point, the mass in the liquid phase will be less than that in the vapour and more than in the solid – due to the extent of squeeze and consequent changes in matter content. And the differences here are what we now call – **latent heat**.

With this model in perspective, the transverse and longitudinal contraction factors, for uniform rectilinear motion, are seen to be δ and δ^2 , respectively, where $\delta = (1 - v^2/c^2)^{1/2}$, also known as the Lorentz-FitzGerald contraction factor; see (2) for derivation of these factors from first principles, yes, of classical mechanics, and (4) for extra figures and illustrations.

The following is worth highlighting to envisage what has made relativity to now descend to earth from its abstract perch.

1. In Einstein's thought:

- (a) The atom at rest has zero contraction: Longitudinal dimension / Transverse dimension = $1/1 = 1$.
- (b) Under motion at v , the body has zero contraction in the direction transverse to motion: Transverse dimension = 1.
- (c) Under motion at v , the body contracts to δ in the direction of motion: Longitudinal dimension = δ .
- (d) The contraction of body in the direction of motion with respect to its transverse dimension is thus $\delta/1$, or δ .

2. In this final **insight**:

- (a) The atom at rest has zero contraction: Longitudinal dimension / Transverse dimension = $1/1 = 1$.
- (b) Under motion at v , the body contracts to δ in the direction transverse to motion: Transverse dimension = δ .
- (c) Under motion at v , the body contracts to δ^2 in the direction of motion: Longitudinal dimension = δ^2 .
- (d) The contraction of body in the direction of motion with respect to its transverse dimension is thus δ^2/δ , or δ , as in 1(d) above.

Hence, the Lorentz-FitzGerald contraction factor, though empirically correct by virtue of **1(a), 1(d), 2(a) and 2(d)** – the reason for the partial success of Einstein's relativity theories, it

is still fundamentally flawed, by virtue of 1(b), 1(c), 2(b) and 2(c) – the reason for the limitations of Einstein's relativity theories. And the famous Michelson-Morley Experiment of 1887 becomes but a reconfirmation of this simple perspective on the world of atoms (4).

References:

1. Born, M., *Einstein's Theory of Relativity*, Dover Publications, New York (1965).
2. A Synopsis: www.sittampalam.net/Synopsis.htm.
3. *Aether Drift: Observation* Blackbody radiation can appear isotropic only in one frame of motion. An observer moving relative to this frame finds that the Doppler shift makes the radiation hotter than average in the direction of motion, cooler in the backward direction. That means the CBR [Cosmic Background Radiation] acts as an aether, giving a local definition for preferred motion.
Peebles, P. J. E., *Principles of Physical Cosmology*, Princeton University Press (1993); p. 151.
4. The Final Theory of Relativity: www.sittampalam.net/Relativity.htm.

A friendly yet serious challenge to readers: Refute the above to the sole satisfaction of the Editor, *Physics World* – and be awarded US\$25,000 in cash; details in www.sittampalam.net.

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