Physics is our body of knowledge on matter, its motion, and interactions

This knowledge can be built up only by adding our “understanding” or internalizing, to what we can sense or perceive. Then we add postulates and hypothesis to the empirical. Thus, we build up the physical theory which consists of both observables and unobservables.

Due to this structure of physical theories, they are susceptible to **Changes**. Even a single crucial observation and new insight can sometimes change or overthrow a physical theory.

Suppose we are told and shown that a fundamental theory we all believe in for more than a century is in fact in gross error, and shown evidence for that fact…

This will be more jolting than realizing, several hundred years ago, that the Earth was NOT the centre of the planetary system.

I will present SEVERAL empirical and logical proofs to show that our present “firmly believed” theories of relativity and dynamics need drastic revisions.

We all know that a clock that moves relatively ages more slowly

Time dilation in Einstein's Special relativity is well known

Clocks in Einstein's Special Relativity

$$dT^2 = dt^2 - dx^2/c^2 = dt^2(1 - v^2/c$$

v is Relative velocity

Formula, Yes; Reason, No.

$$dT^2 = dt^2 - dx^2/c^2 = dt^2\,(1 - v^2/c^2)$$

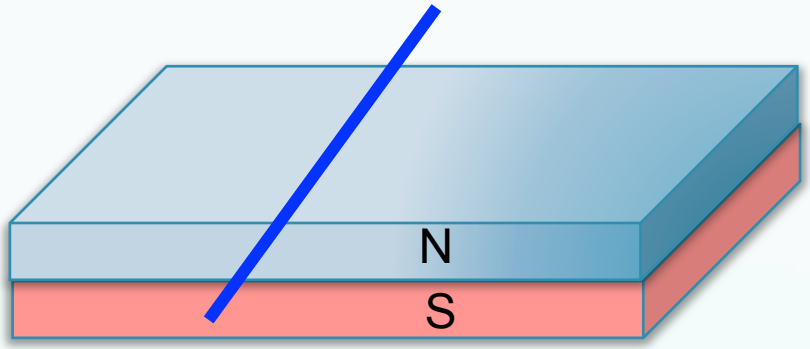
Moving clock can runs faster! Clocks & GPS

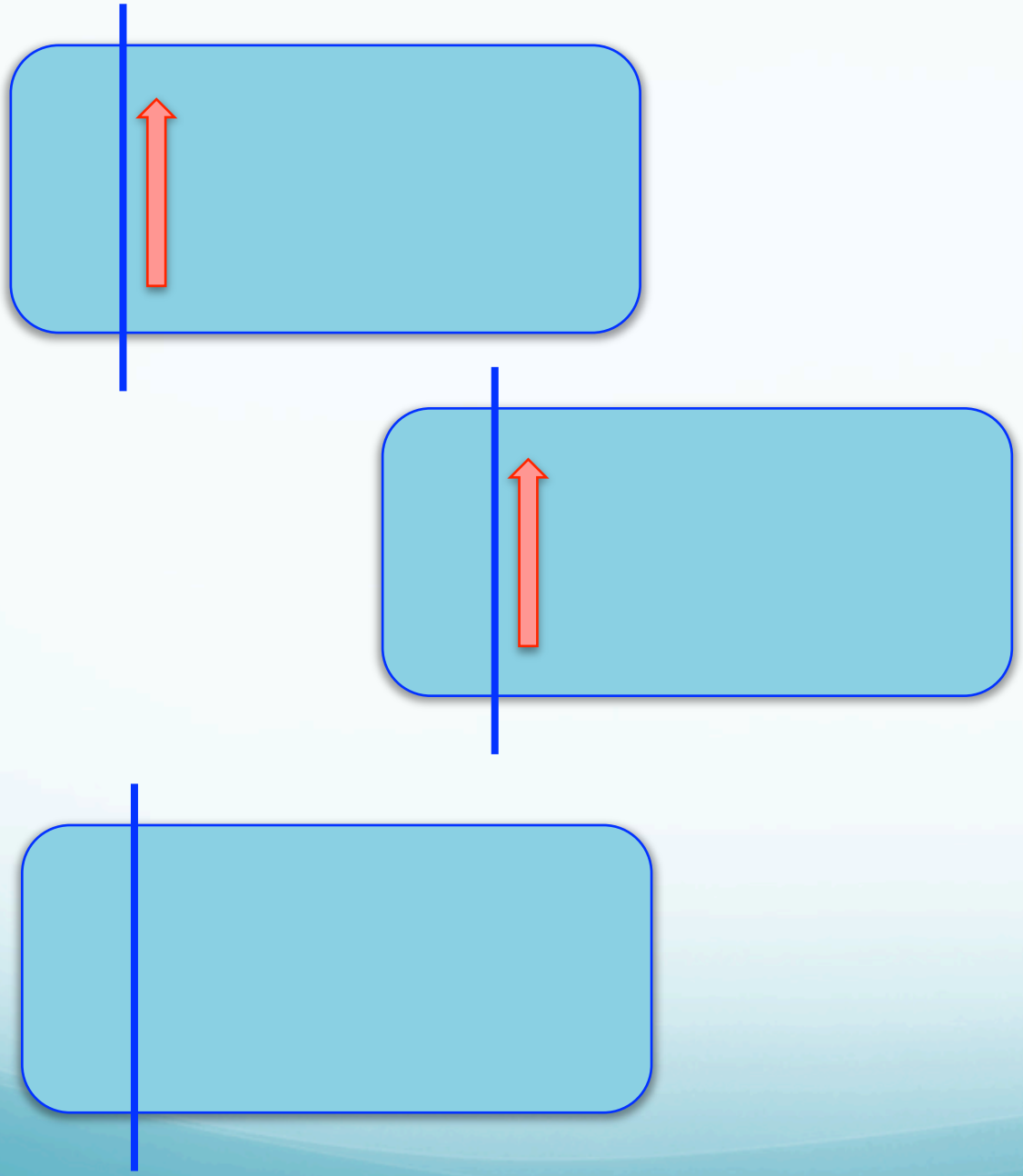
Electrodynamics

It is known that Maxwell's electrodynamics, as usually understood at the present time, leads to asymmetries which do not appear to be inherent in the phenomena. Take, for example, the reciprocal electrodynamic action of a magnet and a conductor… depends only on the relative motion of the conductor and the magnet.

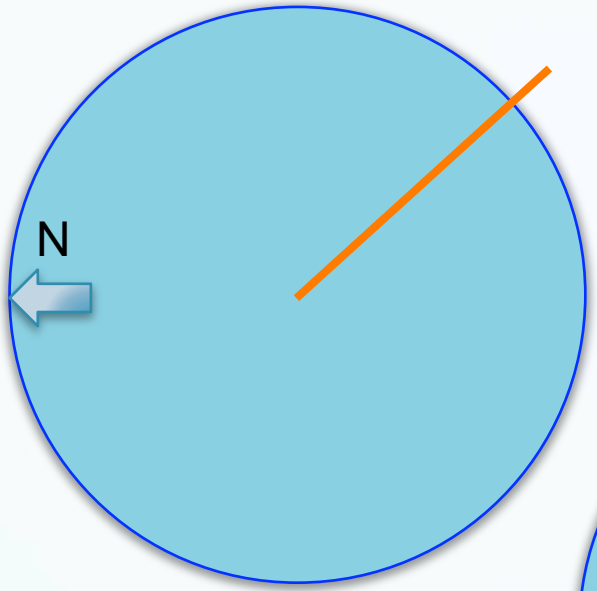
A. Einstein, Annalen der Physik, 1905

Unipolar induction





$$V = v \times B$$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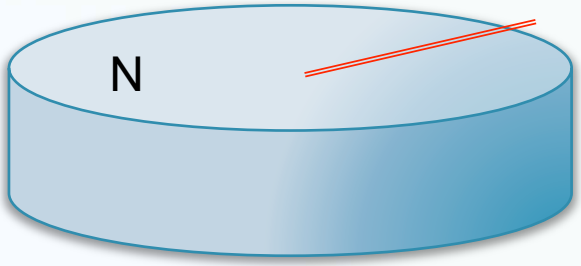
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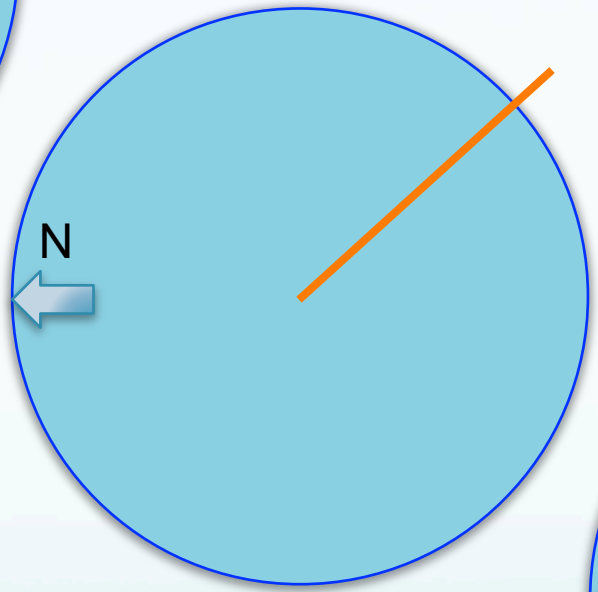
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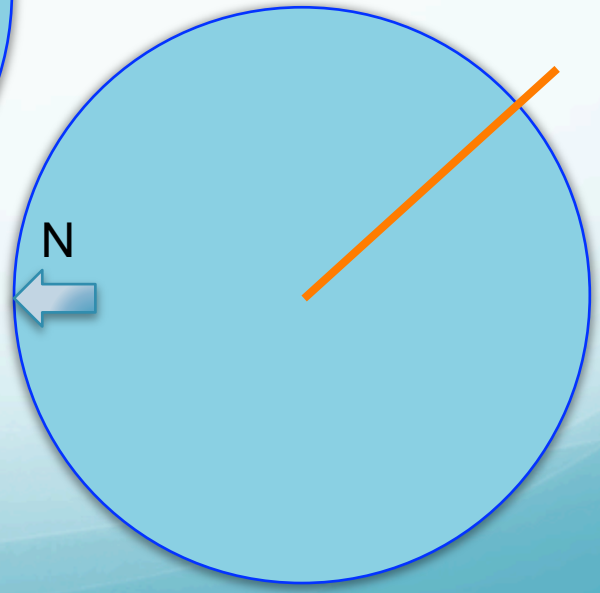
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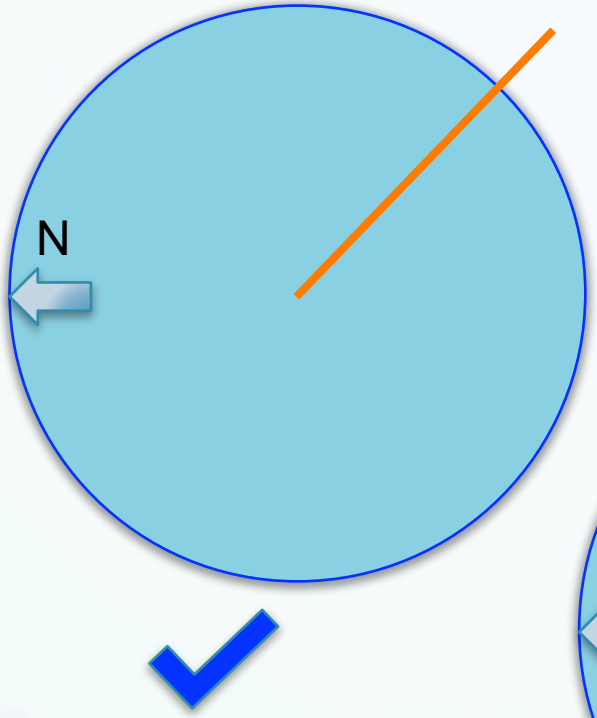
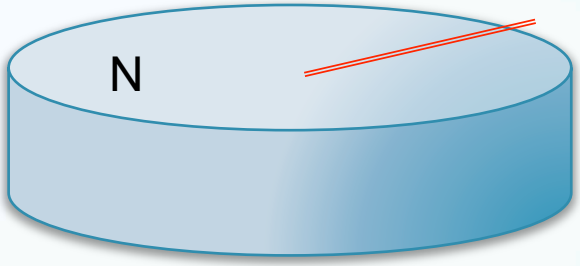
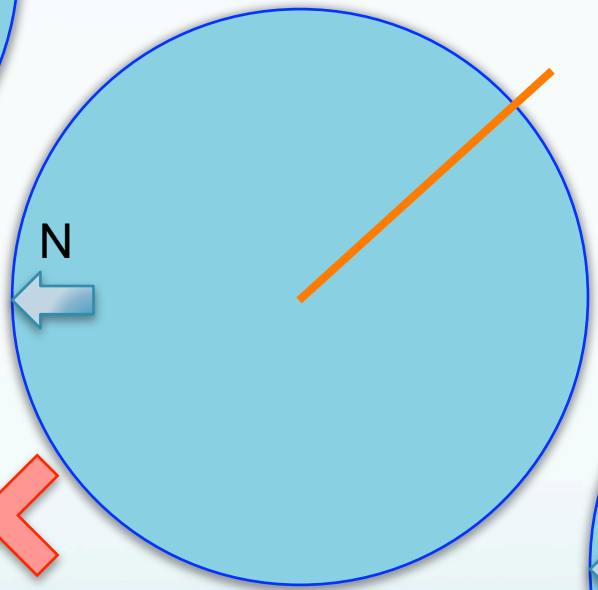
Einstein was not aware of the full experimental situation (Faraday and Ampere)

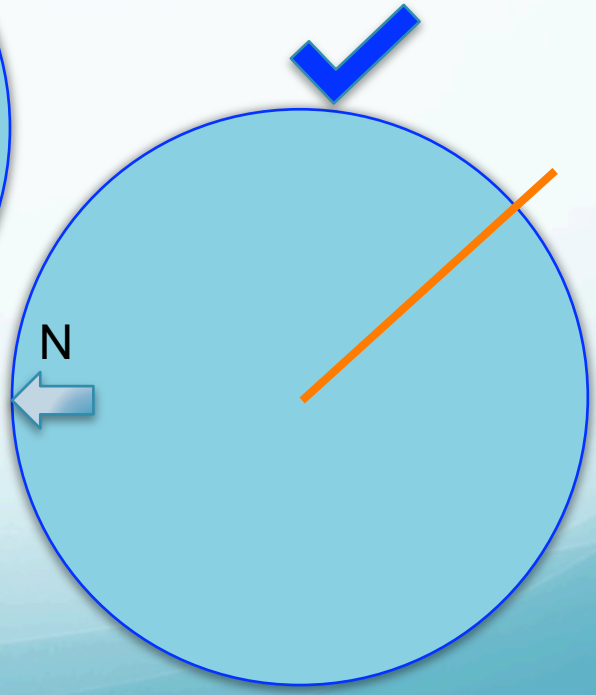
$$V = \int_0^R \left(v(r) \times B \right) dr$$

$$= \int_0^R \left(r\omega B \right) dr$$









The Bakerian Lecture: Experimental Researches in Electricity. Second Series

Michael Faraday

Phil. Trans. R. Soc. Lond. 1832 **122**, doi: 10.1098/rstl.1832.0007, published 1 January 1832

Electrodynamics

It is known that Maxwell's electrodynamics, as usually understood at the present time, leads to asymmetries which do not appear to be inherent in the phenomena. Take, for example, the reciprocal electrodynamic action of a magnet and a conductor… ~~depends only on the relative motion of the conductor and the magnet~~.

A. Einstein, Annalen der Physik, 1905

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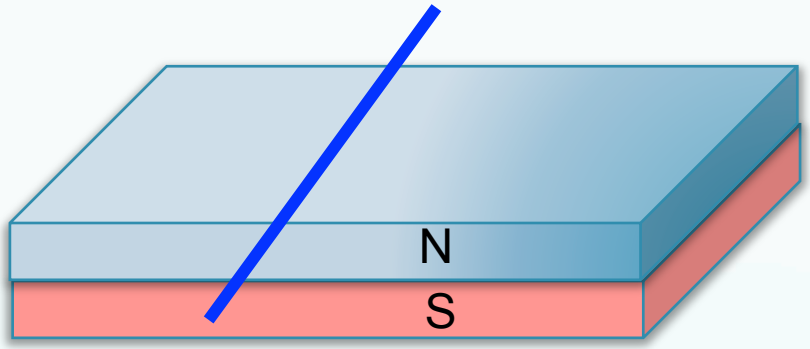
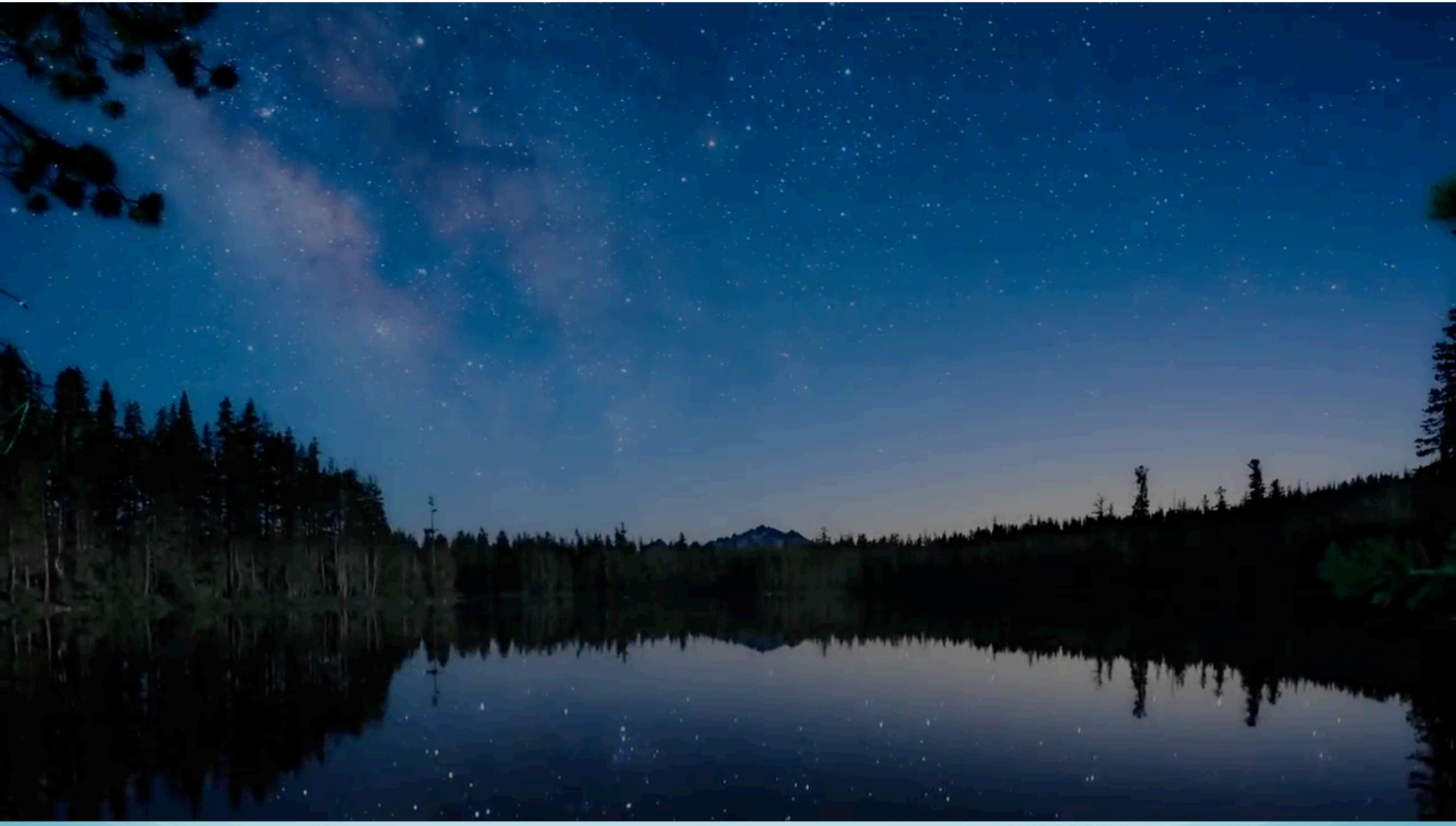


Empty Space is Isotropic and Homogeneous, and remains so in all moving frames

ALL our fundamental theories assume this background called Minkowski space-time and metric.

This is the REASON for Lorentz Transformations

The real situation about the SPACE in physics



Real space becomes anisotropic in moving frames, with a matter current

A serious problem with the foundations of fundamental theories

All our fundamental theories of the physical world were completed well before we acquired ANY significant knowledge about the physical universe, its content and its long term evolution.

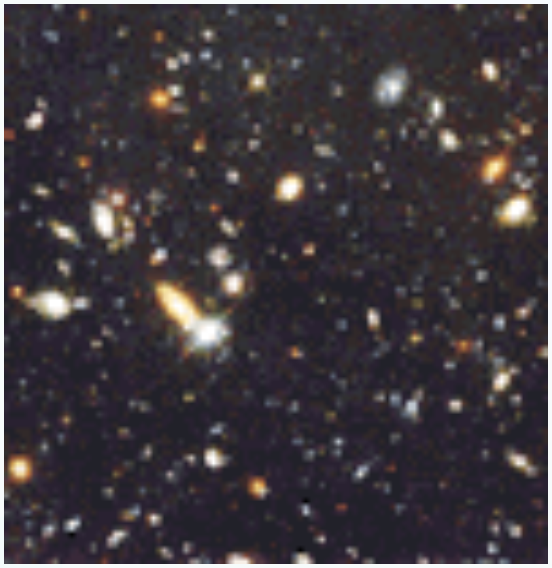
In particular, the **theories of relativity and dynamics** (including QM) as well as the theory of gravity were **developed assuming an EMPTY space** (universe). This is the Minkowski Space-Time → Homogeneous and Isotropic in EVERY frame.

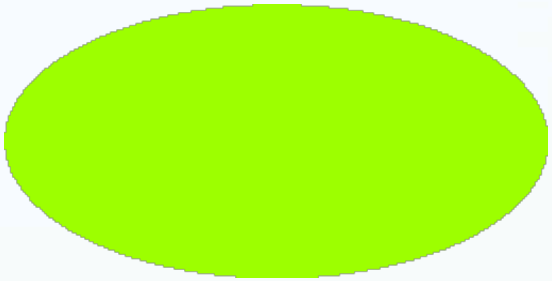
But in **reality**, **space is not empty**! It has **matter and its gravity everywhere** at an average density of 10^{-29} gm/cm^3.

So, all of physics and human activities are done in the enormous gravitational potentials of cosmic matter, whereas fundamental theories, as constructed, do not include these effects– A major reconsideration becomes essential.

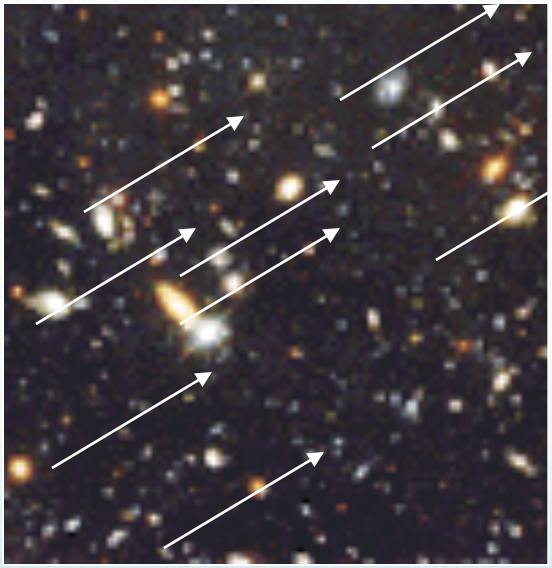
Reality: Universe with matter and radiation

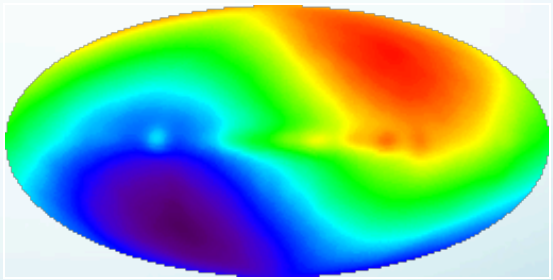
There is ONE special frame in which V=0





In all other frames,





SPACE is anisotropic in the frame of a moving observer. There is a large current of matter (the charge of gravity)

$$ds^2 = -c^2\,dt^2 + dx^2$$

$$\begin{bmatrix} g_{00} & g_{0x} \\ g_{x0} & g_{11} \end{bmatrix} = \begin{bmatrix} -c^2 & 0 \\ 0 & 1 \end{bmatrix} \equiv \begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$$

With Lorentz transformation, this remains invariant.

But we live WITHIN this universe, with a FRW metric, and Space with Matter! We **do not** live in a Minkowski (empty) universe. Why are we living with such logical poverty, blind to simple truths?

$$\boldsymbol{ds^2 = -c^2\,dt^2 + a^2(t)\,dx^2}$$

When we move in this universe, there a matter current and Space is anisotropic. Anybody can see it and convince about this fact. So, we know from OBSERVATIONS that metric becomes anisotropic in moving frames the real world. **This is clear empirical evidence against the Lorentz transformations as the physically correct transformations**.

But what about VERFIED PHYSICAL PHENOMENA like Time dilation?

I will now show you a simple and profound miracle

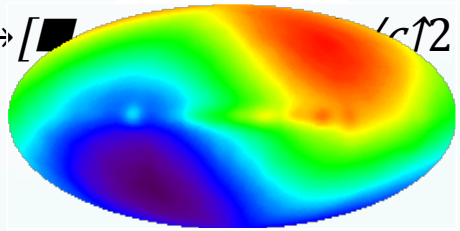
$$ds^2 = -c^2\,dt^2 + a^2(t)\,dx^2 \approx -c^2\,dt^2 + dx^2$$

Let us move in this universe and do a Galilean Transformation

$$ds'^2 = -c^2\,dt^2 + v^2\,dt^2 - v\,dx\,dt + dx^2 \quad x' = x - vt;\ t' = t$$

$$ds'^2 = -c^2\,(1 - v^2/c^2)\,dt^2 - v\,dx\,dt + dx^2$$

$$\begin{bmatrix} g_{00} & g_{0x} \\ g_{x0} & g_{11} \end{bmatrix} = \begin{bmatrix} -c^2 & 0 \\ 0 & 1 \end{bmatrix} \rightarrow \begin{bmatrix} -(1 - v^2/c^2) & -v/c \\ -$$



Here is BOTH time dilation and anisotropy, exactly as we observe. Time dilation has nothing to do with Lorentz transformation. It is Galilean phenomenon. It depends on the ABSOLUTE VELOCITY.

Clocks in Einstein's Special Relativity

$$dT^2 = dt^2 - dx^2/c^2 = dt^2(1 - v^2/c$$

v is Relative velocity

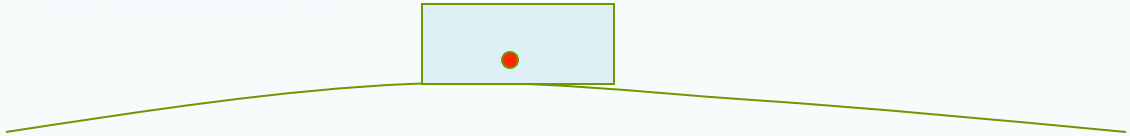
Formula, Yes; Reason, No.

Moving clocks in Reality

Universe with matter is an absolute frame

What we thought as ”Ether” -- an absolute reference frame for motion, dynamics and relativity in the 19th century, is in fact the Matter-filled universe and its gravity.

Gravitational potential "here"



Earth: $\dfrac{GM_E}{c^2 R_E} \sim 10^{-9}$

Sun: $\dfrac{GM_S}{c^2 R_S} \sim 10^{-8}$

Galaxy: 10^{-6}

Distant masses dominate!

$$\Phi_{gU} \approx 10^{17}\ \mathrm{m}^2/s^2$$

$$\Phi_{gE} \approx 10^{8}\ \mathrm{m}^2/s^2$$

$$\sqrt{1-\frac{v^2}{c^2}}\sqrt{1-\frac{v^2}{\Phi_U}}$$

$$\Phi_{gU} \approx c^2 !$$

$$\Phi_U \approx \int_{All\ Galaxies} G\cdot(4\pi\rho R^2 dR)/R \approx 2\pi G\rho R^2{}_H$$

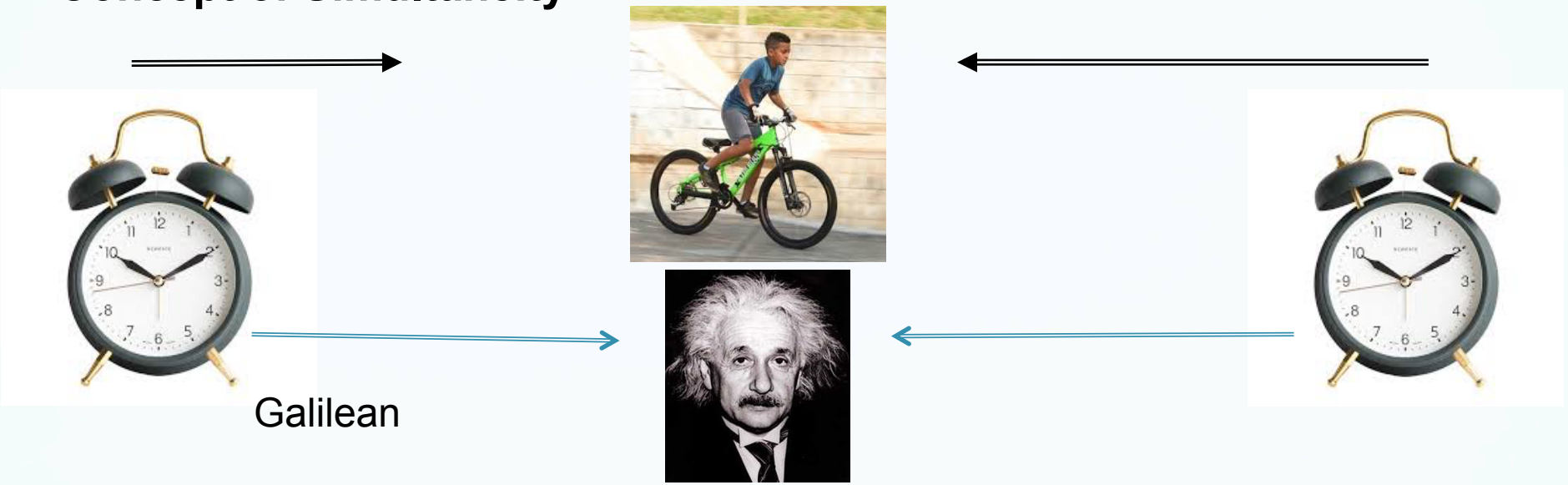
Are two events (A and B) which are simultaneous with reference to one reference frame also simultaneous relatively to another frame, moving relatively?”

A. Einstein, 1905

Concept of simultaneity of two separated event is at he BASIS of relativity, Lorentz transformations, relativistic metrology, GPS clocks and synchronization etc.

However, velocity of sound (and other familiar waves) depend on the velocity of the observer (listener): $c \downarrow r = c \pm v$

Concept of Simultaneity



Galilean

Since the velocity of sound DEPENDS on the velocity of listener, the one moving relative to the air does not hear the bells Simultaneously, though they were ringing at the same time relative to the stationary listener.

Two distant events judged as simultaneous by one observer will be perceived as successive (not simultaneous) by another moving observer **when the relative velocity of the messenger waves is Galilean** (not a constant)

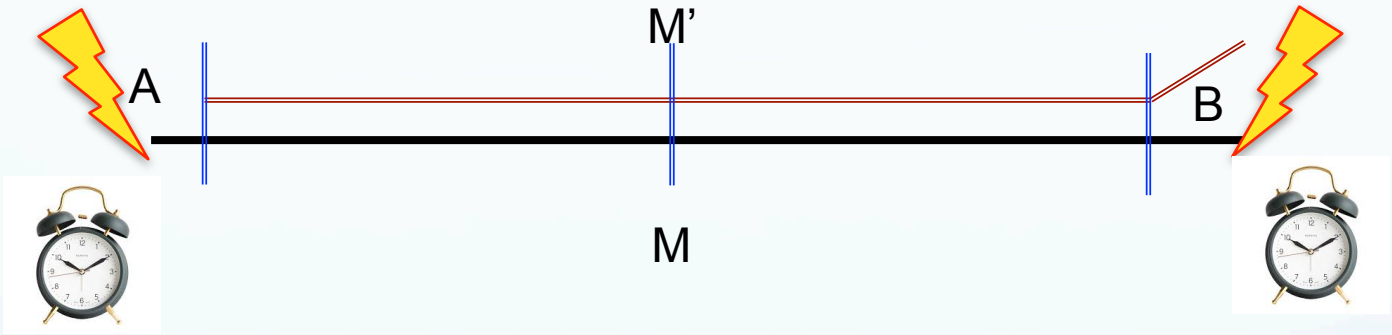
IF the velocity of sound were CONSTANT, independent of the velocity of the observer, two events simultaneous to one would have been also simultaneous to another, who is relatively moving.

Concept of Simultaneity -- Einstein

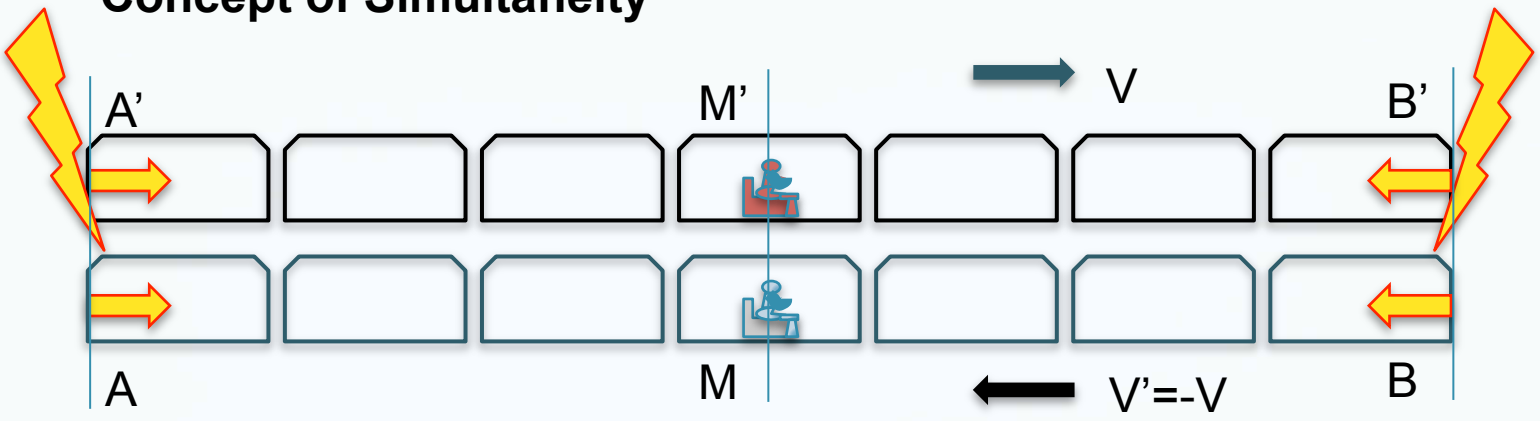
Difference: No "medium" and the Velocity of light is the same for all observers

"Are two events (e.g., the two strokes of lightning A and B) which are simultaneous with reference to the railway embankment also simultaneous relatively to the train?"

A. Einstein, Relativity: The Special and General Theory (1916/1920)



Concept of Simultaneity



If velocity of light is universal, and same for both, they are equivalent, and have the SAME experience. **In the frame of each, they will see the lightning simultaneously.**

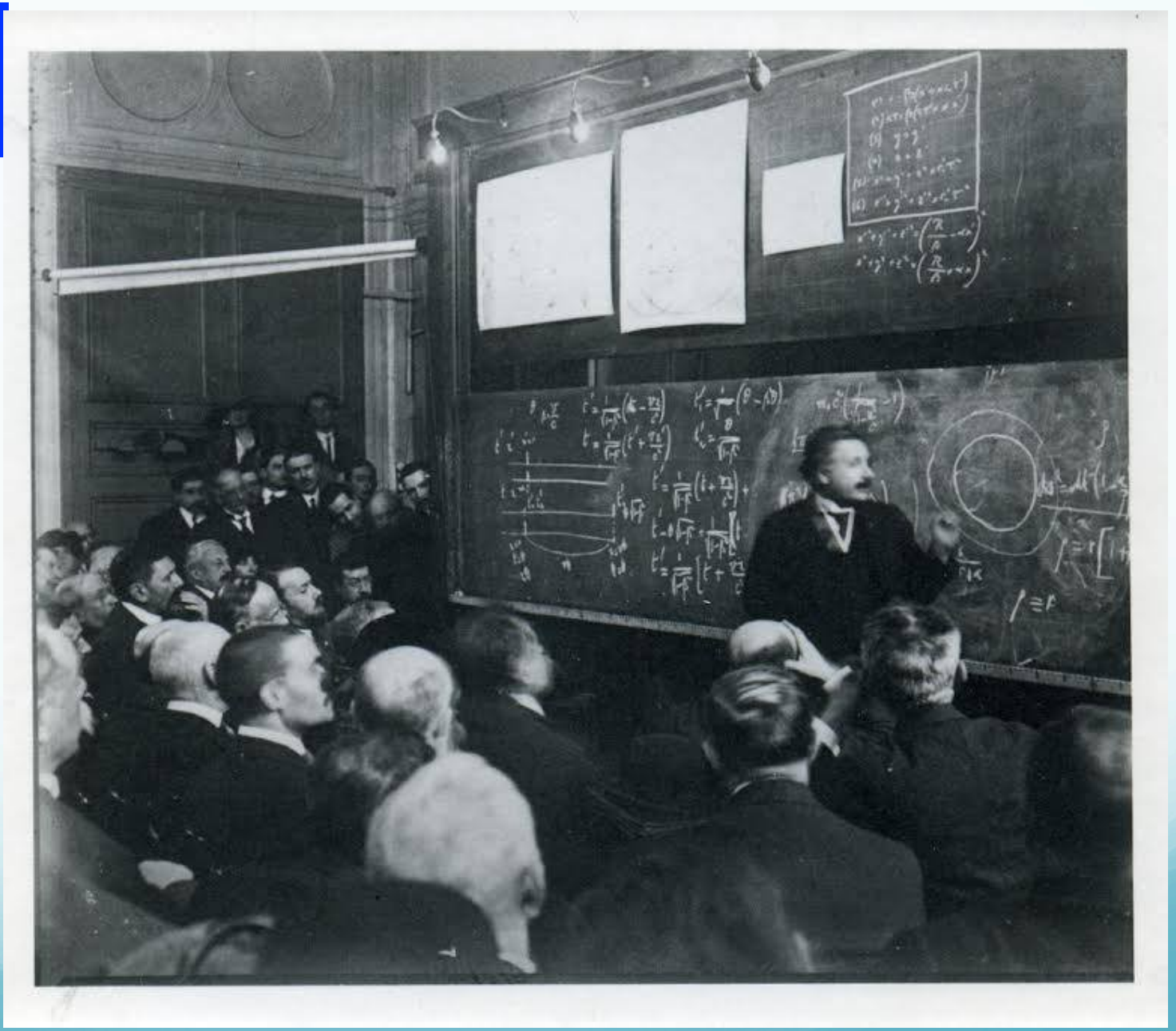
But Einstein's conclusion was…

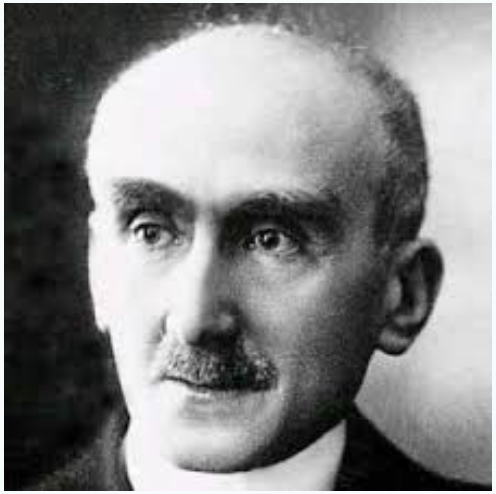
"Observers who take the railway train as their reference-body must therefore come to the conclusion that the lightning flash B took place earlier than the lightning flash A. We thus arrive at the important result:
Events which are simultaneous with reference to the embankment are not simultaneous with respect to the train, and vice versa (relativity of simultaneity)."

Thus a fatal error in the formulation of Special Relativity that renders the theory inconsistent was made by Einstein – anybody can read his writings and verify this.

The philosopher Henri Bergson pointed this out already in 1922

1922

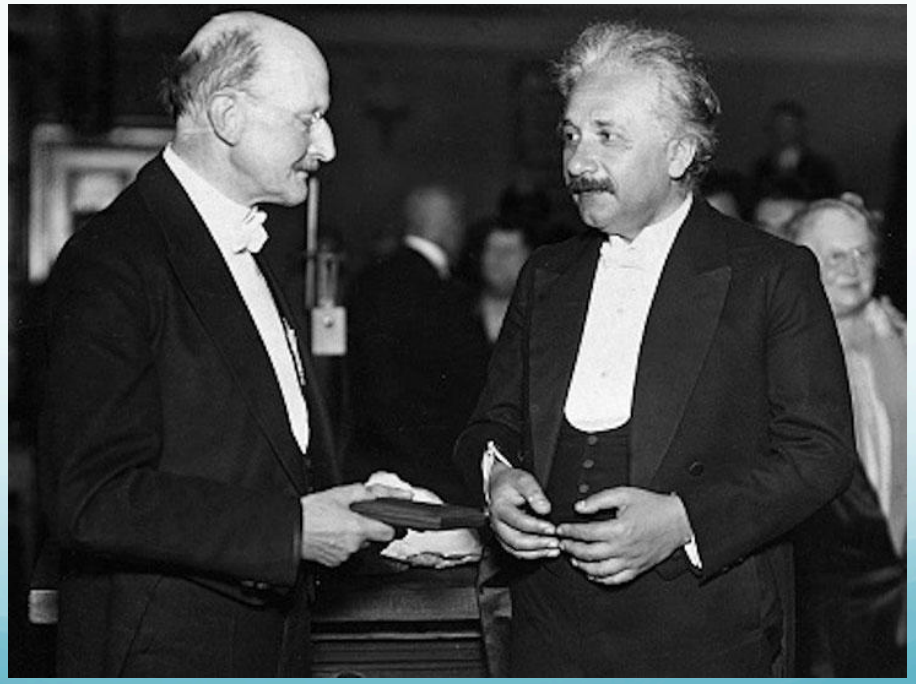




Henri Bergson

Duration and Simultaneity:
With reference to Einstein's theory (1922)

Bergson criticized Einstein during 1922 visit, at the session in Sorbonne, and in his book, with remarkable clarity. Bergson was perhaps the first to pinpoint Einstein's error and confusion regarding the notion of simultaneity in his own theory



A fatal error in the formulation of Special Relativity that **renders the theory inconsistent** was made by Einstein – anybody can read his writings and verify this.

A. Einstein, Relativity: The Special and General Theory

The philosopher Henri Bergson pointed this out already in 1922, in his book “Duration and Simultaneity”

‘This passage enables us to catch on the wing an ambiguity that has been the cause of a good many misunderstandings...we must not forget that the train and the track are in a state of reciprocal motion...

Let us now emit our two flashes of lightning. The points from which they set out no more belong to the ground than to the train; the waves advance independently of the motion of their source.

It then becomes evident at once the two systems are interchangeable, and that exactly the same thing will occur at M' as at the corresponding point M. If M is at the middle of AB and if it is at M we perceive a simultaneity on the track, it is at M', the middle of B'A', we shall perceive this same simultaneity in the train...what is simultaneity with respect to the track is simultaneity with respect to the train.’

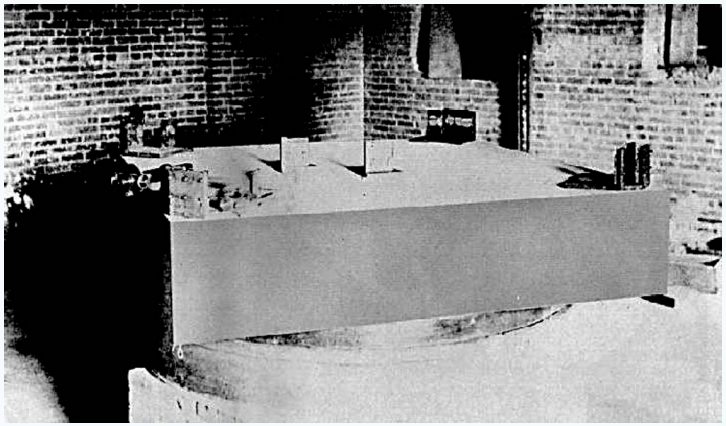
"However, ... there is still something infinitely troubling in the Einsteinian system. This system is admirably coherent, but it rests on a particular conception of the propagation of light. How are we to imagine that the propagation of a ray of light could be identical for an observer who flies away from it, and for an observer who rushes forward to meet it? If this is possible, it is in any case inconceivable to our customary mentality, and no matter how hard we try, we cannot make the mechanism and nature of that propagation intelligible.

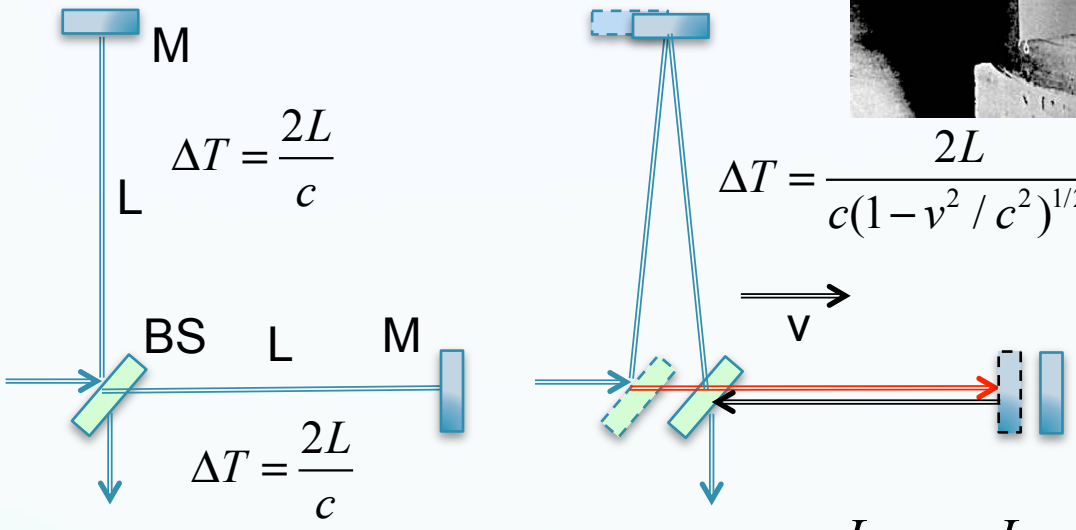
It must be confessed that here lies a “mystery” which eludes us. The whole Einsteinian synthesis, as coherent as it is, rests on a mystery, exactly like the revealed religions.”

Charles Nordmann, 1922

This postulate has never been verified in any experiment !

Michelson-Morley experiment





$$\Delta T = \frac{2L}{c}$$

$$\Delta T = \frac{2L}{c(1-v^2/c^2)^{1/2}}$$

Lorentz

$$\Delta T = \frac{L}{c-v} + \frac{L}{c+v} = \frac{2L}{c(1-v^2/c^2)}$$

Einstein

$$\Delta T = \frac{2L}{c}$$

Independent of v because velocity of light is independent v

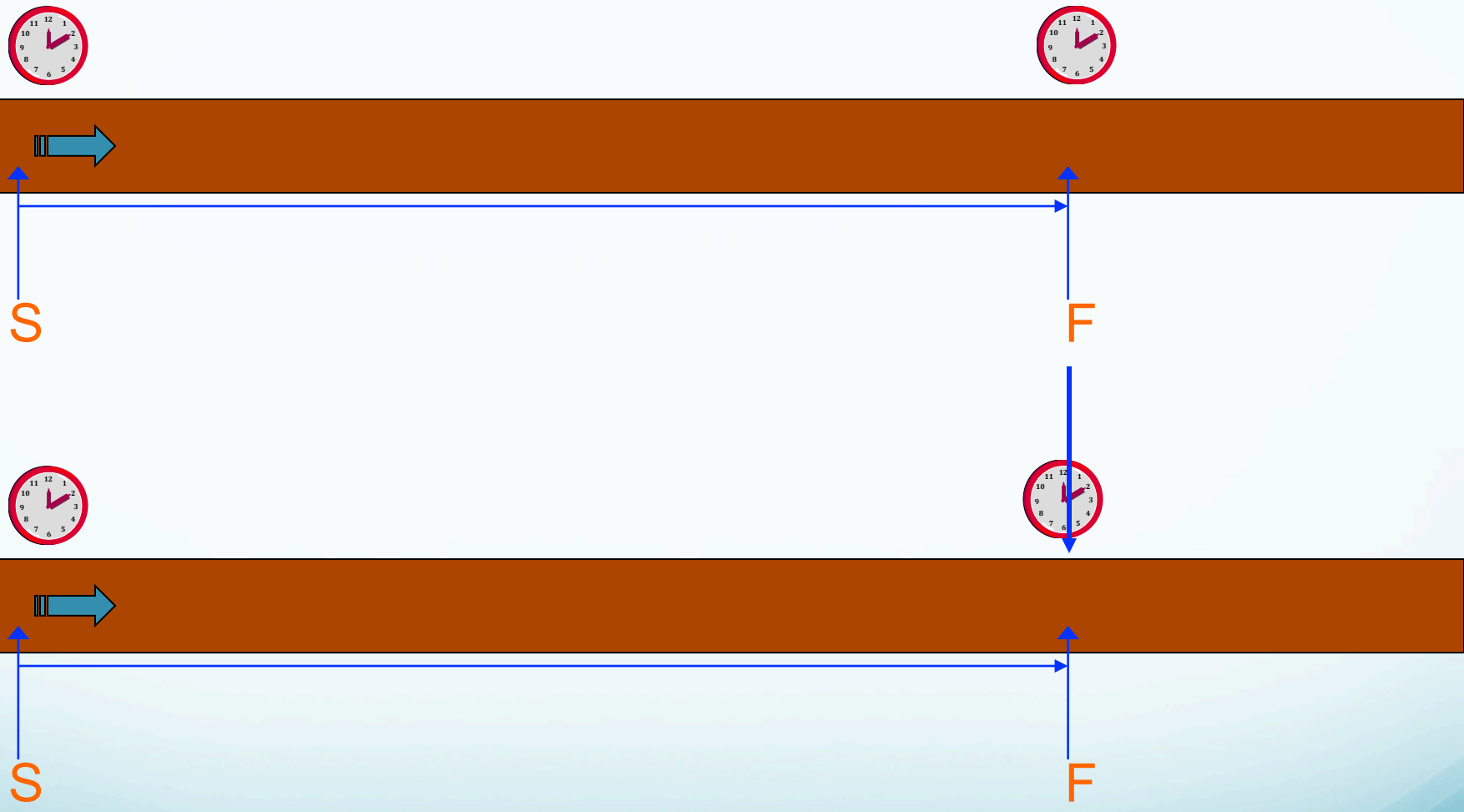
If $\Delta T_v = \Delta T(1-v^2/c^2)^{1/2}$ *and*

$L_v = L(1-v^2/c^2)^{1/2}$, *then Duration* $= \frac{2L}{c}$

No Real length contraction or time dilation

Note that, in this solution, the relative velocity of light is Galilean (c±v)

Measuring one-way speeds



There is a problem of Synchronization of Clocks

3
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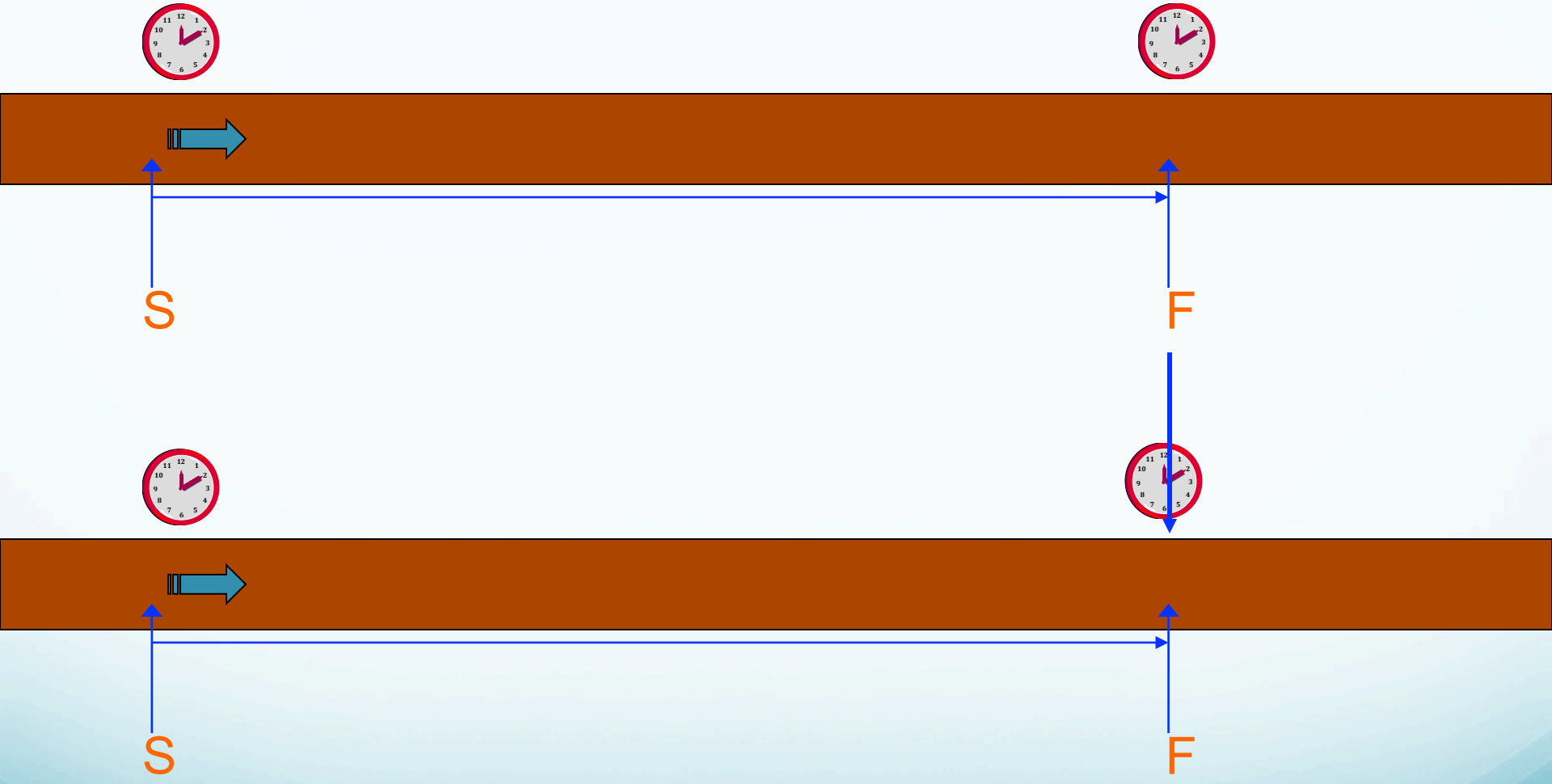
Measuring one-way speeds



There is a problem of Synchronization of Clocks

I solved the problem of Clock Synchronization

WR 43.18
OR 43.49
0.0

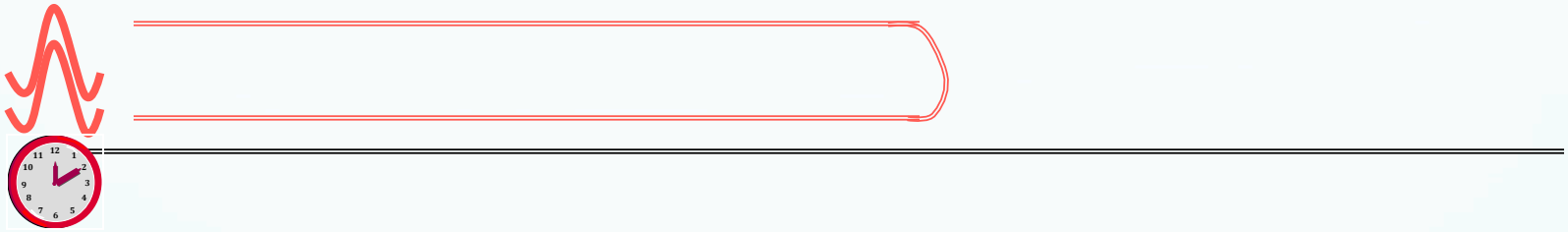
Measuring one-way relative velocities

Need to synchronize the clocks!

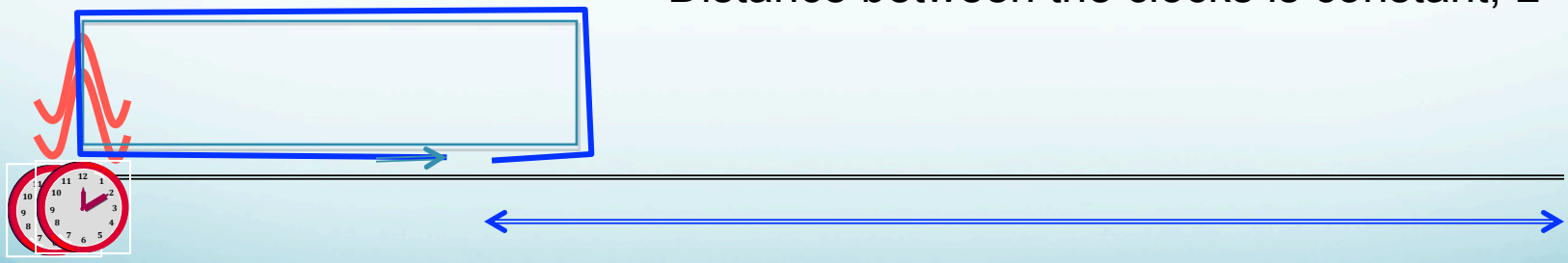
Synchronizing clocks

So, there is no way to do this independent of the theory, it seems…

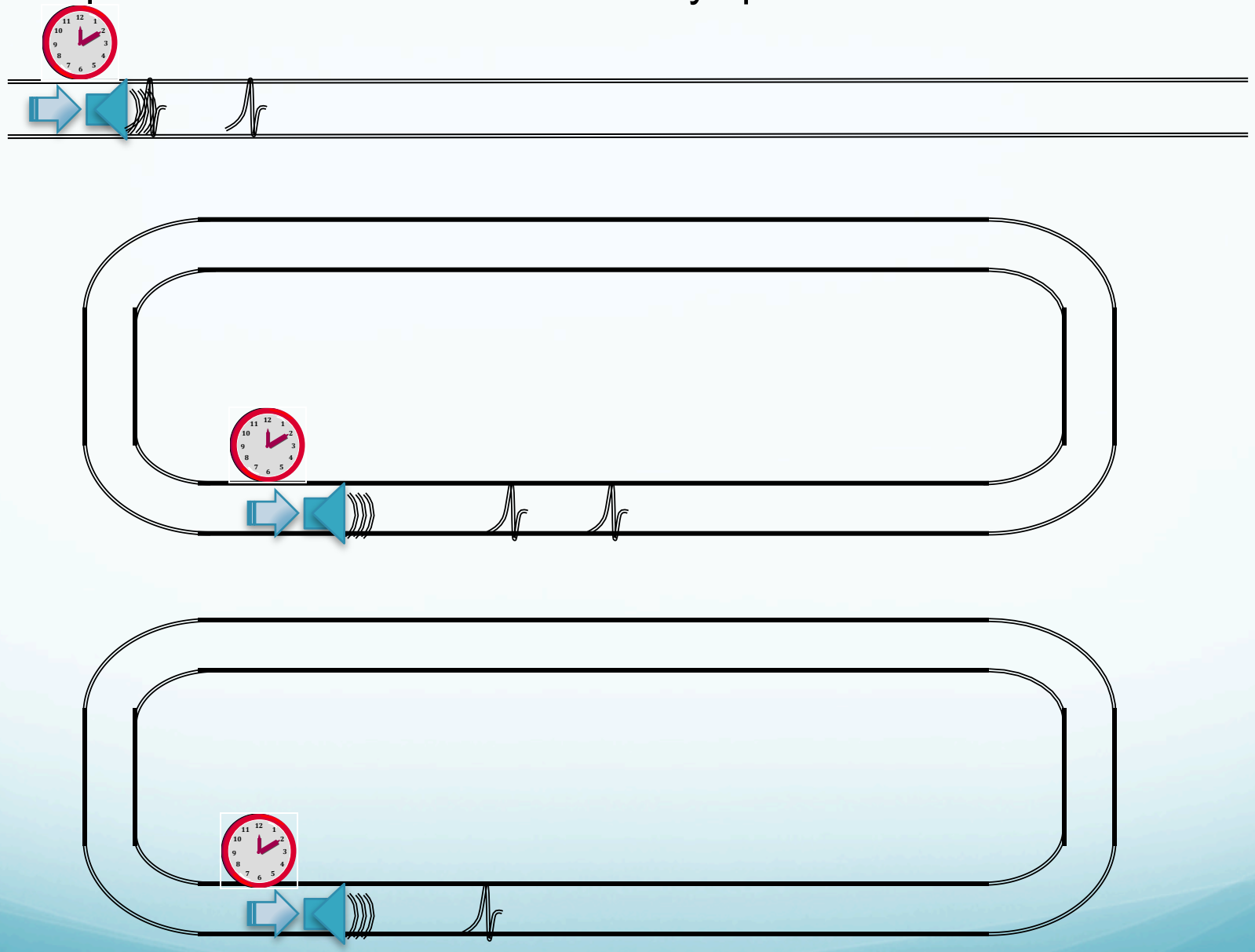
Distance between the clocks is constant, L

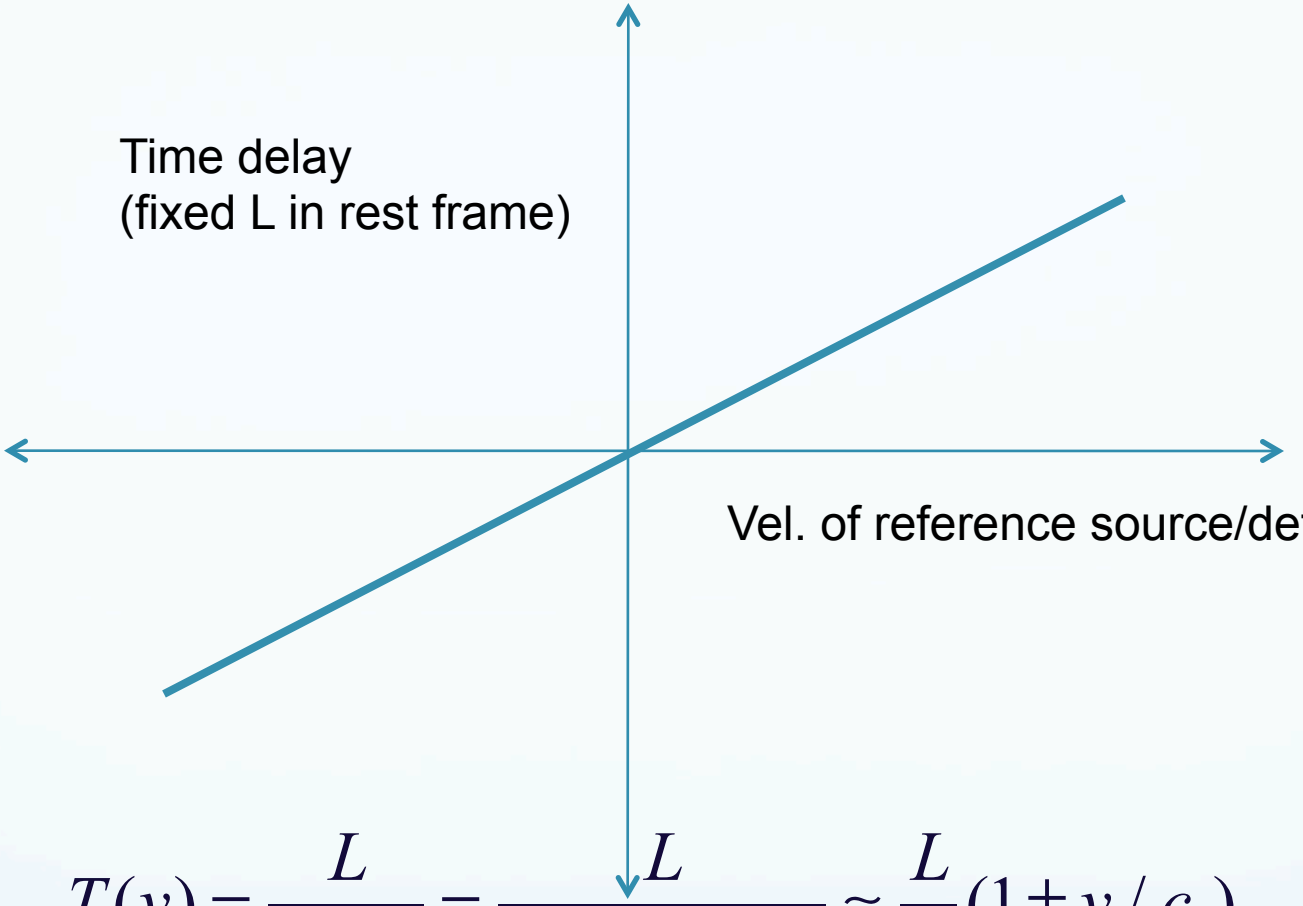


Distance between the clocks is constant, L



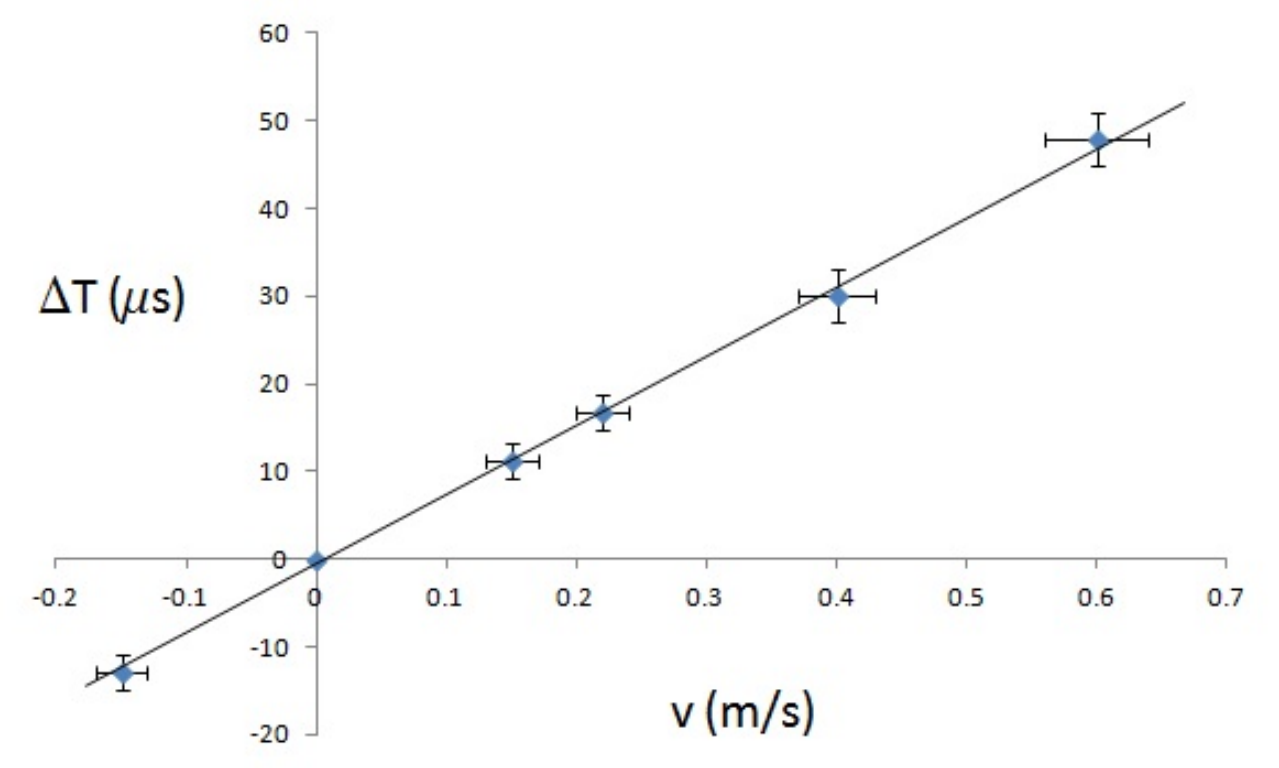
An experiment to measure the one-way speed of Sound



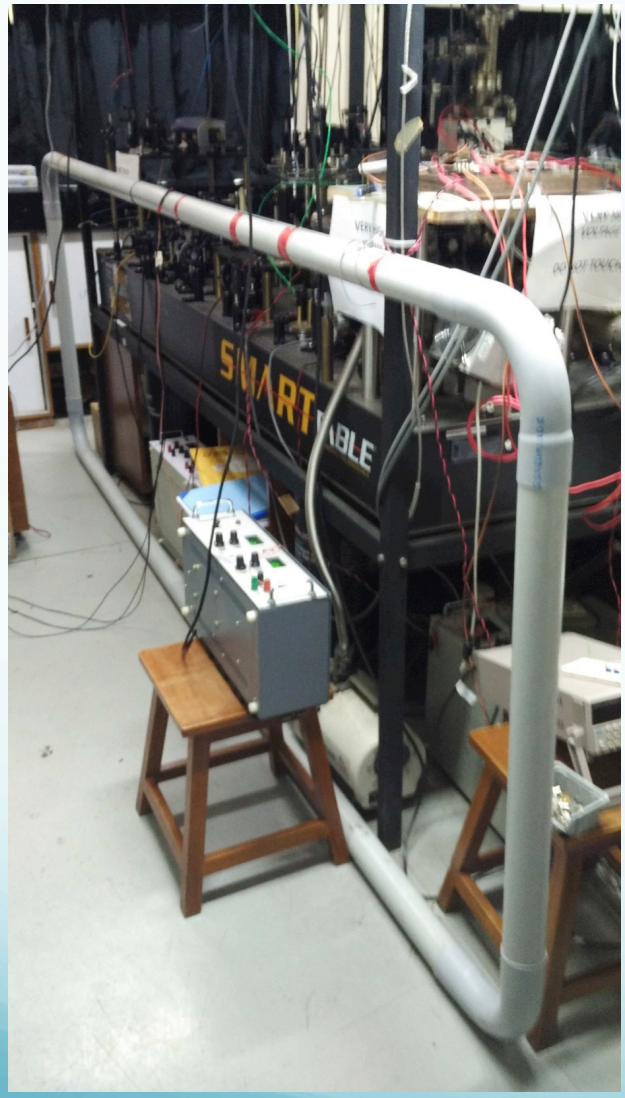


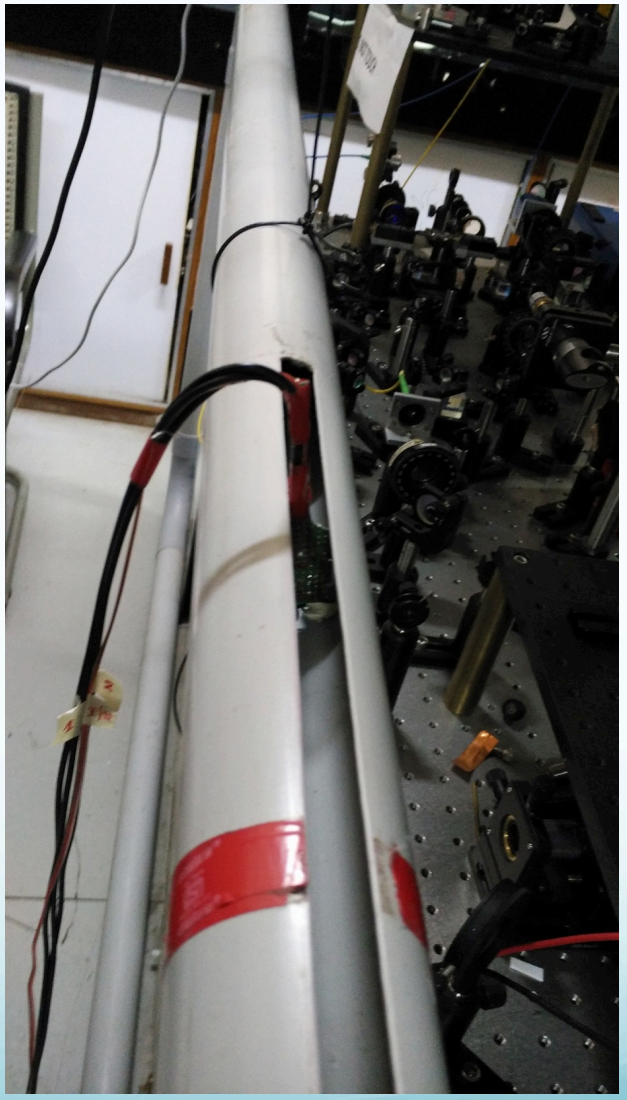
$$T(v) = \frac{L}{c_s \mp v} = \frac{L}{c_s(1 \mp v/c_s)} \simeq \frac{L}{c_s}(1 \pm v/c_s)$$

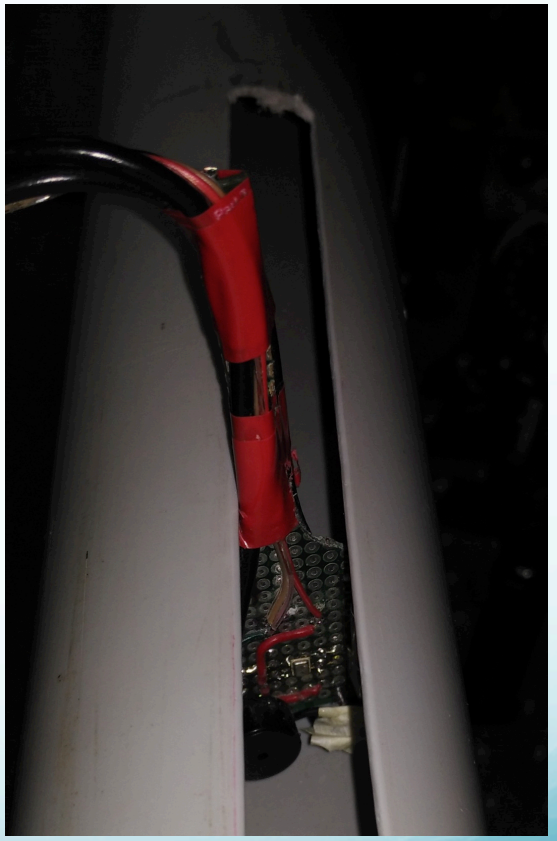
$$\Delta T(v) = \frac{L}{c_s}\frac{v}{c_s}$$

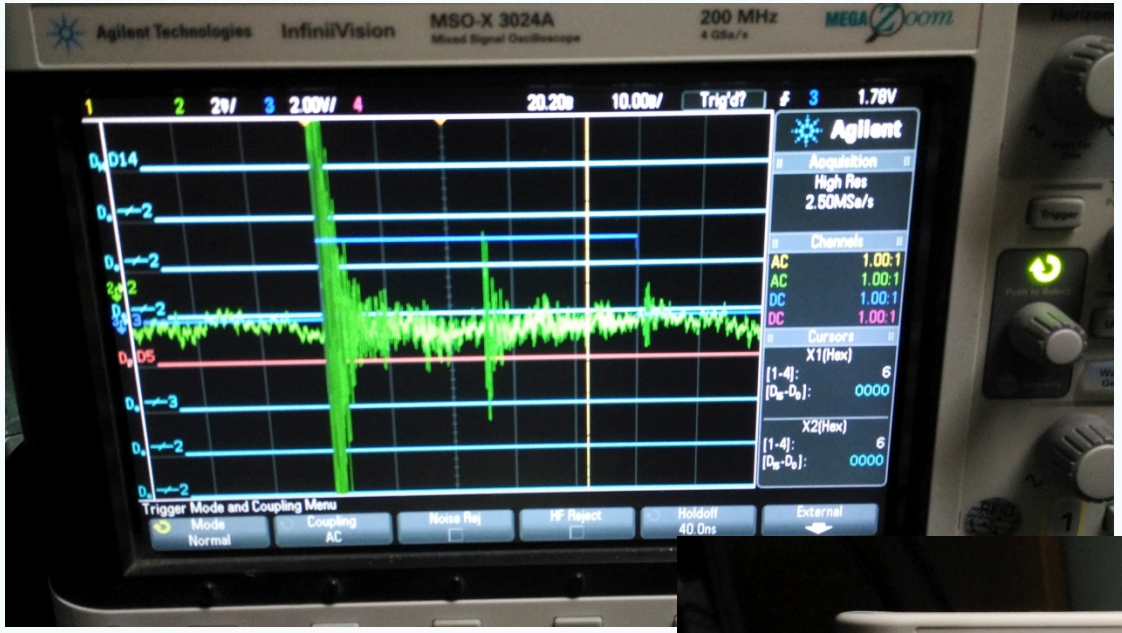


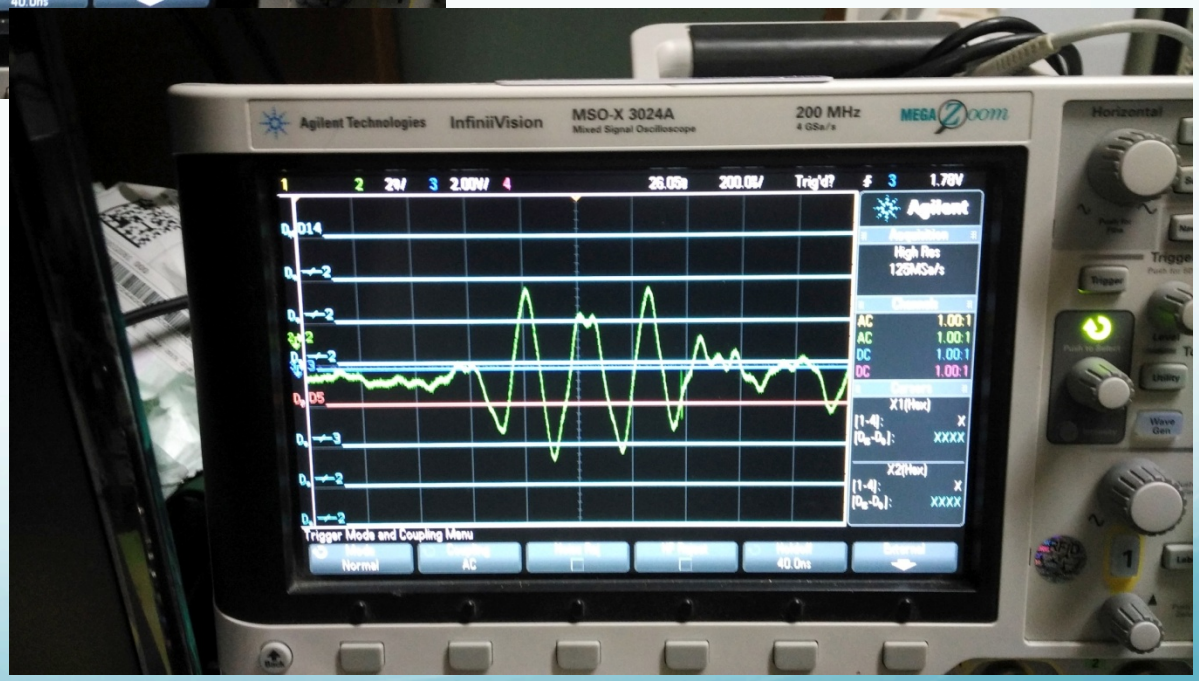
$$\text{Relative Velocity} = c \pm v$$

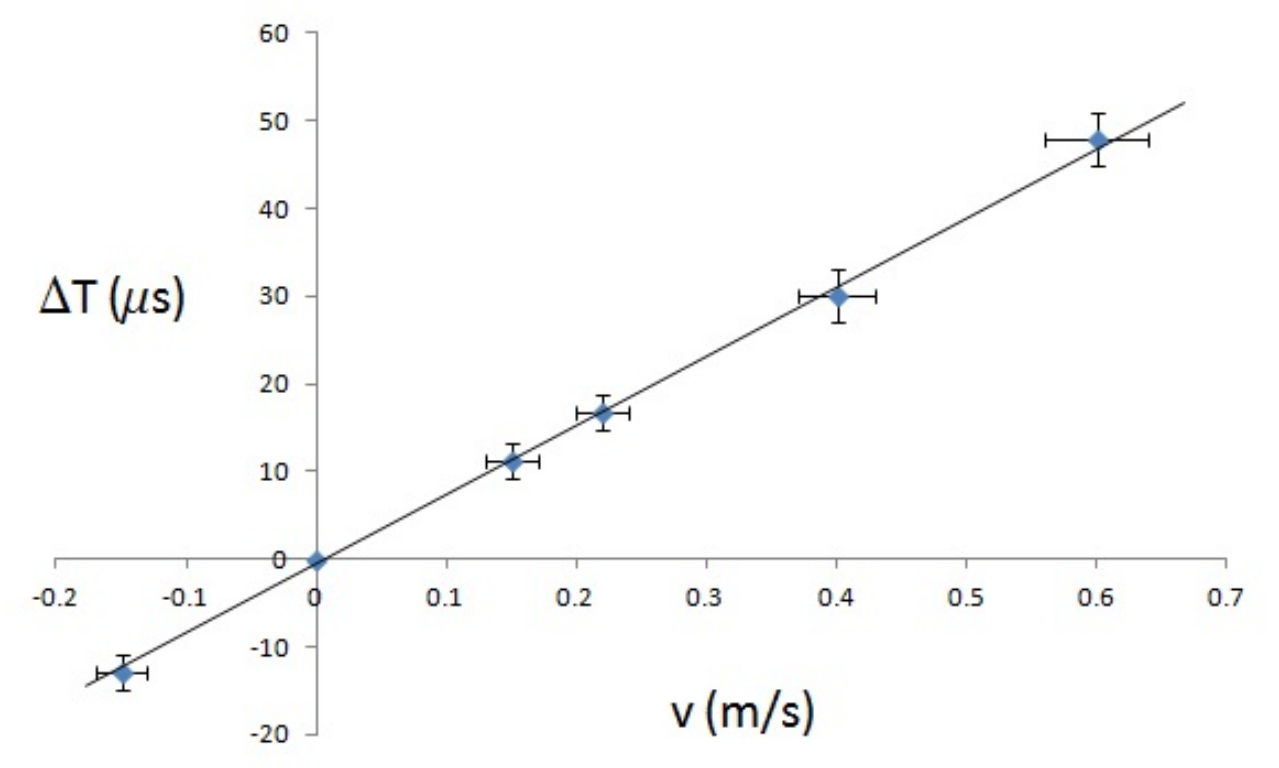






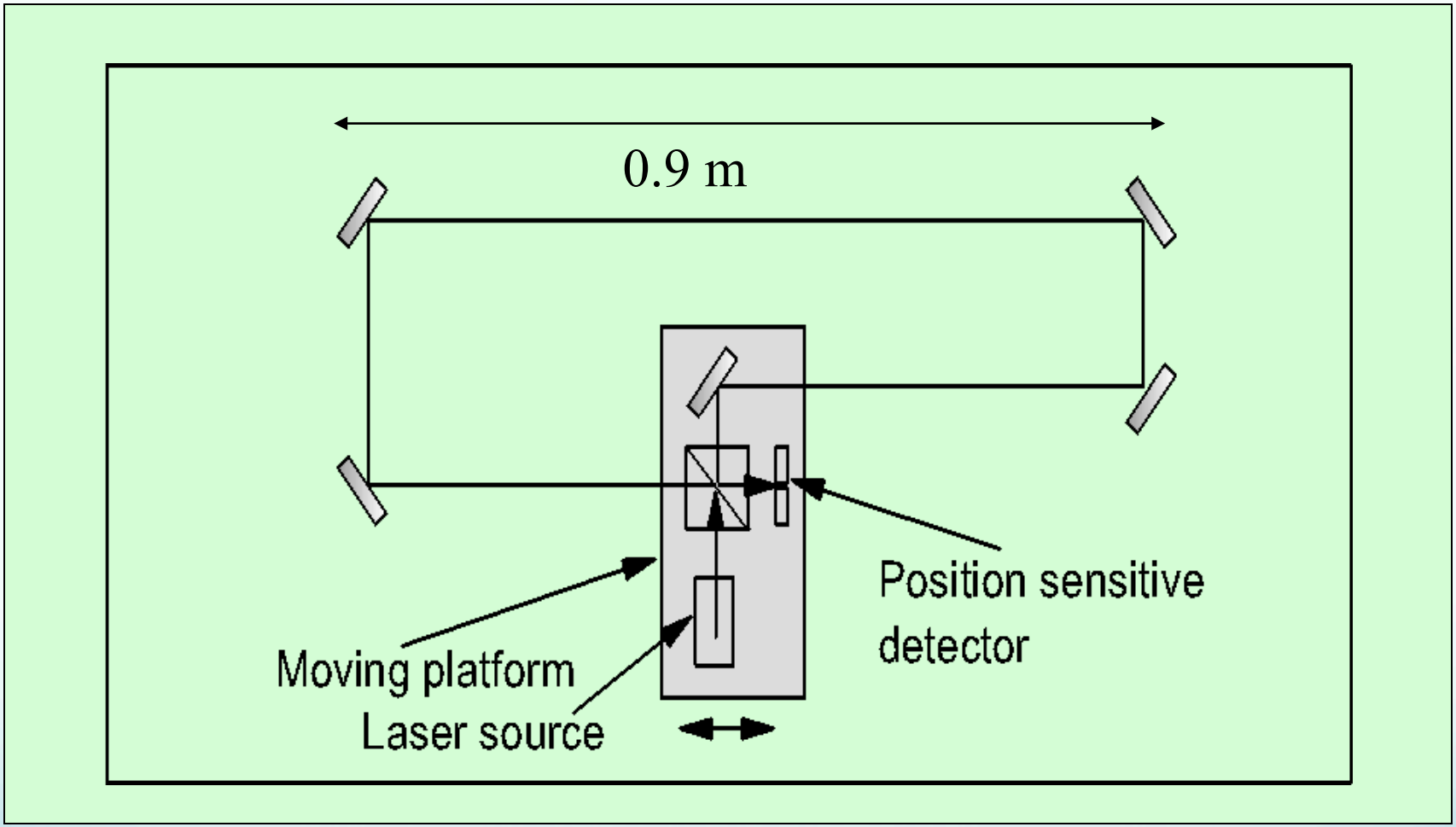

Agilent Technologies
InfiniiVision
MSO-X 3024A
Mixed Signal Oscilloscope
200 MHz
4 GSa/s
MEGA Zoom
Agilent
Acquisition
High Res
2.50MSa/s
Channels
AC 1.00:1
AC 1.00:1
DC 1.00:1
DC 1.00:1
Cursors
X1(Hex)
[1-4]: 6
[D8-D0]: 0000
X2(Hex)
[1-4]: 6
[D8-D0]: 0000
Trigger Mode and Coupling Menu
Mode Normal
Coupling AC
Noise Rej
HF Reject
Holdoff 40.0ns
External


Agilent Technologies
InfiniiVision
MSO-X 3024A
Mixed Signal Oscilloscope
200 MHz
4 GSa/s
MEGA Zoom
Horizontal
Agilent
High Res
125MSa/s
AC 1.00:1
AC 1.00:1
DC 1.00:1
DC 1.00:1
X1(Hex)
[1-4]: X
[D8-D0]: XXXX
X2(Hex)
[1-4]: X
[D8-D0]: XXXX
Trigger Mode and Coupling Menu
Normal
AC
40.0ns

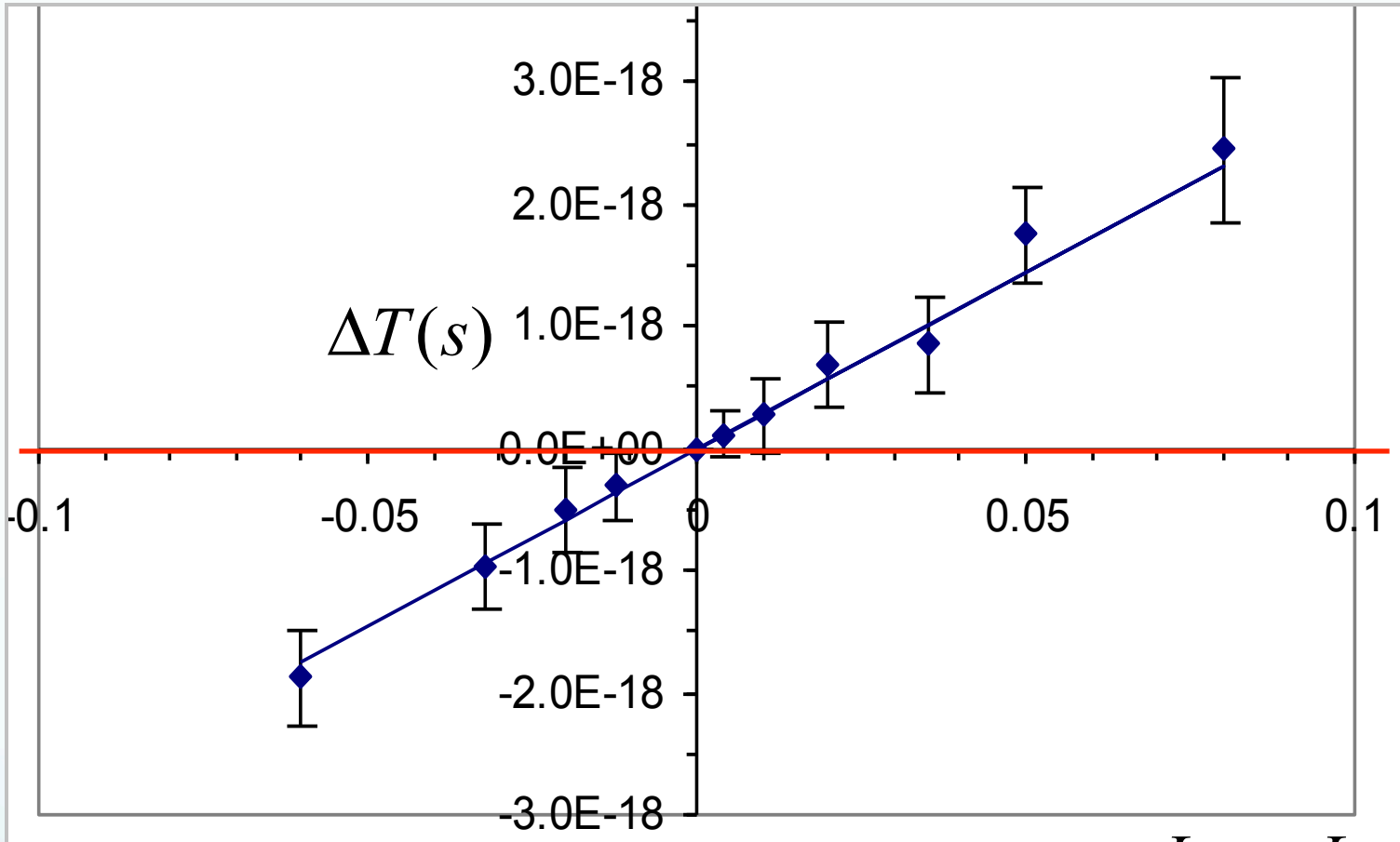


Velocity of sound is Galilean. $T(v) = \frac{L}{c(v)} = \frac{L}{c \, \mathrm{m}v}$; $\frac{L}{c}(1 \pm v/c)$

Experiment in identical configuration for light

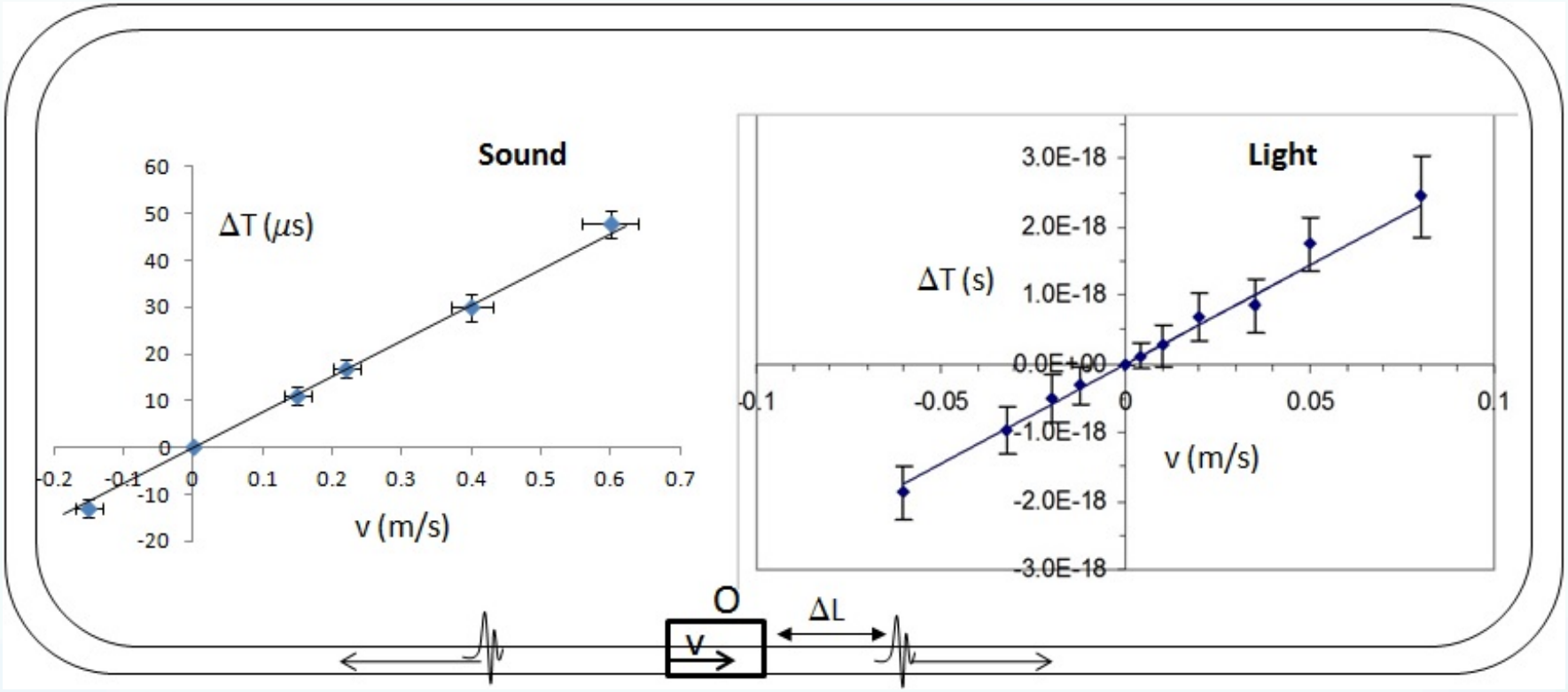


Results



$$T(v) = \frac{L}{c(v)} \; ; \; \frac{L}{c}(1 \pm v/c)$$

The relative one-way velocity of light is **Galilean** to first order



The relative one-way velocity of light is **Galilean**, similar to sound.

Not an invariant constant.

$$\text{Relative Velocity} = c \pm v$$

I have shown you clear experimental evidence that the relative velocity of light is exactly like the relative velocity of sound and other familiar waves – Galilean.

I have also shown you other proofs for an absolute frame and then argued for cosmic gravity being the cause for ALL relativistic effects, including usual time dilation in GPS etc.

If we continue to believe that the relative velocity of light is invariant and that special relativity is correct, that would be perhaps be worse than continuing to believe, due to absolute faith, that Earth is at the centre of of the planetary system.

THANK YOU FOR YOUR ATTENTION

Modifying the Einstein's equations:

$$R\downarrow\mu\nu - 1/2\ Rg\downarrow\mu\nu = 8\pi G/c\uparrow 4\ \ T\downarrow\mu\nu = \kappa T\downarrow\mu\nu$$

Einstein's equations are written down in this "once given" universe, and all its tests are in the presence of the matter-energy in the universe. But the gravity of the large amount of "source" is not part of the equations of the theory of gravity ! General Relativity is Incomplete.

We need to ADD the density of matter and energy of the universe to the Einstein's equation as a permanent, non-removable term.

But this provides the universal frame (of the matter-filled universe) to the Einstein equations. There is a universal time, the same everywhere in the universe. There is NO general coordinate invariance, NO Lorentz invariance in the limit, and the propagation of light and gravitational waves are Galilean.

$$R\downarrow\mu\nu - 1/2\ Rg\downarrow\mu\nu - 8\pi G/c\uparrow 4\ \ U\downarrow\mu\nu = 8\pi G/c\uparrow 4\ \ T\downarrow\mu\nu$$

Centenary Einstein's Equations: Machian and Galilean

Imagine that the atoms are slightly charged, at the tiny undetectable level of 10^{-35}

During 1875-1900 we had no idea about the vast amount of matter in the universe

Maxv ertial frames !

I al to the
e
e ces.

We v , electrically.

Bu al charge.
Ur inly, that all
the nal forces.
Si mic gravity.
It t s simple
ph