The Problem with the Relativity of Simultaneity

Abstract

Relativity claims that the simultaneity between two (or more) observers, each travelling in different Inertial Reference Frames (IRFs) is such that "Both observers consider the clock of the other as running slower". This is shown on a Minkowski diagram in the section titled "Time dilation" on the Wikipedia page given in my Reference [2]. However, as I will explain, this interpretation leads to an inconsistency which cannot be true. I point out the error being made in the interpretation of Minkowski diagrams that leads to this inconsistency, and how the diagram should be interpreted to correct this error.

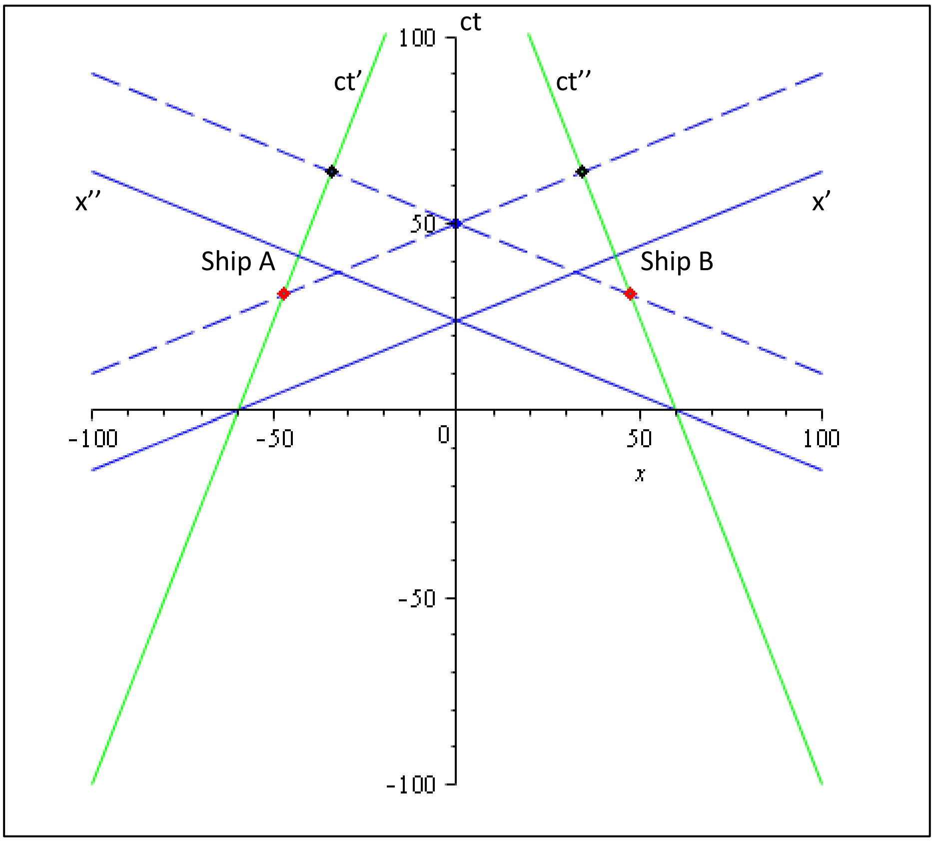

Figure (1)

The diagram above (Figure 1) is a Minkowski diagram depicting two spaceships approaching each other at 40% of the speed of light. Ship A is moving from left to right and ship B from right to left. The Black axes are for a stationary observer between ships A and B (y axis is ct, x axis is distance). The Green axes are ct' and ct'' respectively and the blue axes are x' and x'' respectively. The dashed blue lines are parallel to x' and x'' and are lines of simultaneity for each of the ships (A and B). These dashed lines pass through an event on the stationary observer's ct axis (at coordinates 0,50), where the event is indicated by a blue dot.

Relativity would have you believe that where the lines of simultaneity of ships A and B pass through the other ships ct axis (indicated by Black dots) indicate what time on the other ship (B and A) is simultaneous with the first ships ct intersect is. Therefore, so Relativity claims, ship A observes a different time on ship B, and vice-versa. However, it is easy to prove that this interpretation is wrong: If each of the three observers (ship A, ship B and the stationary observer in the middle) send signals to each other indicating their own current time, then each of the signals form ship A and ship B arrive at the event on the stationary observer's ct axis (indicated by a blue dot).

Simultaneously, the stationary observer's time signal travels from the blue dot to each of ships A and B ct axes (indicated by the Red dots). As all three of these points are connected by lines of simultaneity, all readings correspond to the same moment (although each observers clock may show a different time). Each ship sends its current time to the observer at the Blue dot and he displays the times on a screen visible to each ship, each ship sees the screen at a time simultaneous with its Red dot. So, as the Red dot points are simultaneous with the blue dot event on the stationary observer's ct axis, the Black dot points CANNOT also be simultaneous with these events as Relativity claims.

Furthermore, if the claim is made that the different time observed from one ship to the other are just what is OBSERVED rather than 'real' time differences, then that too is incorrect as the lines of simultaneity depict actual simultaneity of events and there is no propagation delay due to the travel time of light included in the diagram. For the difference in time to be just an observational difference one would have to explain the difference between observed time and actual time to be due to the time taken for the light signal to travel from one ship to the other. So, in actual fact, to correctly determine the time that is simultaneous on ship A from ship B's point of view (and vice-versa), one must follow the dashed blue line of simultaneity from ship B up to the point where it intersects with ship A's line of simultaneity (the other dashed Blue line), and then one must follow ship A's line of simultaneity until it intersects with ship A's ct axis.

The problem is that a single straight line leads to a an inconsistency: On the one hand an observer on Ship A says that the event on the Blue dot is simultaneous with his Red dot event (and also the observer on Ship B says that the Blue dot event is simultaneous with his Red dot event); yet the single straight line suggests that for the observer on Ship A the Blue dot event is simultaneous with both his own Red dot event and the Black dot event on Ship B's ct axis. Similarly, for the observer on Ship B (his Red dot event appears to be simultaneous with both the Blue dot event and the Black dot event on Ship A's ct axis). Clearly both of these cannot be true: an event on Ship A (or B) cannot be simultaneous with two different events at different times on Ship B's (or Ship A's) ct axis. There is clearly an inconsistency with this interpretation.

The rate of time of each IRF (relative to the observer's IRF) can be determined, even without clock synchronization, by comparison of two or more readings of the other's times over a known local time interval in the observer's IRF. If this is done then ship A's observer will see the same rate of time (as his own) on ship B.

So, if ship A & B can determine that they have the same rate of time when they move towards or away from each other at the same speed through the space/medium field, then they are free to move together until they are both at a point on the Black ct axis. Their respective times on their clocks at that point provides each with a reference point to which they can calibrate all of the time observations they have made and continue to make on their journey towards & away from each other. After synchronizing their clocks to the same time, they then continue past each other whilst observing each other's time continually. They will then deduce that the red dots are simultaneous, not one Red and one Black dot.

This misunderstanding about the Relativity of simultaneity stems from Einstein's mistaken assumption that the speed of light is ***really*** constant in any IRF, rather than just ***measured*** to be so (as I have shown in previous work [1]), but actually has a fixed speed with respect to the space/medium field. The problem in the interpretation of Minkowski diagrams is due to the failure to recognize that each ship's axes represents a different coordinate system and one must map from one coordinate system to the other coordinate system when drawing inferences between the two systems.

REFERENCES

[1] Traill. D. A. "Relatively Simple? An Introduction to Energy Field Theory" The General Science Journal, 2001-2008.

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[2] Wikipedia. "Minkowski diagram".

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[3] Wikipedia. "Relativity of simultaneity".

https://en.wikipedia.org/wiki/Relativity_of_simultaneity Last accessed 4/10/2019