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Thought Experiment – The Twin Paradox

No Affiliation

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In my paper, The Long Bang, May 16, 2016, General Science Journal, I talk about this subject indirectly. I used special relativity in the above paper where the gravity was 10 orders of magnitude less than here on earth where special relativity was discovered to solve for all of the parameters involved in the expansion of our universe.

The twin paradox is a well-known problem. The main jest is that if a set of twin on earth with the age of 21, one twin say A was sent off into space at a velocity of $0.2c$ and twin B remained on earth. One year later twin B was sent off from earth in the same direction with a velocity of $0.4c$. Both twin signed a contract that they would not alter their velocity except to use the rocket motors to keep on the same path and velocity as both used predetermined stars. Their father and each twin had a signal device exactly alike and was calibrated on earth before either twin left. Each twin was carrying the assigned signal device. All three signal devices could transmit data with a rate of one Nano bit per second. The data would be transmitted with pulses lasting one Nano second and with a pause of one Nano second. The transmission would last 100 bits. One and a half years after twin A left earth data was received by the father. The father observed the data and noted that he could tell which twin was sending data by using the velocity assigned to each twin both including the data with pulses and pause using Special Relativity. For twin A both pulses and pauses were about two percent longer with two significant figures than those measured on earth. For twin B they were about four percent longer than measured on earth. We have to recognize the time that each pulses and pause was being sent that twin A spaceship traveled 2.356992 inches and that twin B spaceship traveled 4.713984 inches. Therefore, the length of each pulse and pause observed on earth would be the length of the distance that each of the twins' space ship traveled while transmitting one digit of data. With Special Relativity the father could calculate the time of the transmission and the velocity of each ship and compare it with his time on earth since the pulses and pauses would be a time function. If the father transmitted a signal and both twin received it, both would observe the same and would conclude the father was the one moving but at different velocity. We cannot reconcile these two results without thinking that both are incomplete since both points would have to be in their respective rest frames. Any point where the observer is, is an arbitrary rest frame since we cannot have an absolute rest frame. He would conclude that both spaceships were in their respective rest frame and that time does not dilate for the space ships clocks but only when we transmit information with light. Or in other words, time dilations is relative only for transmission of information. If we use another type of transmission that traveled faster than c , we would not have to use Special Relativity.

Special relativity time dilation only applies to the measurement in the rest location when measurement of time and space is transferred from a moving system to the rest system, i.e., transfer of information. Both twin would be the same age if they should ever meet again since both would be in their rest frame with respect to their time piece. This paradox is based on the transfer of measurements from a moving system to a rest frame and totally based on relative motion in one dimension. The fact is that one can not specify which twin is moving without a universal rest frame of which we cannot determine and with certainty does not exist. Velocity is defined as the ratio of length divided by time. The pulse and the pause contained in the transmission of information in the above scenario is a time function even though it has the unit of length. Therefore, gamma is in both the numerator and dominator and divides out.

Gamma is defined as: $\gamma = \left(1 - \frac{v^2}{c^2}\right)^{-0.5}$. Therefore, the velocity of light is constant in all frames of references.

The current theory of the known universe limit the number of universes like ours to one. In my paper noted above, I proposed that there may be many and in fact may be an infinite number of universes like ours. Also, there may be other universes of universes, universes of (universes of universes), etc. This means that we have no conceptions of where to ever look for an absolute reference frame. We have been here before when we thought that we were the center of something. This really means that other species that once were like us may have been around for billions of years and may be even trillions of years. Fear of these beings is dumb since we cannot have any ways of dealing with them other than hoping that they are at least cheering us on to advance of ours knowledge and to deal with other realities other than those we have now including the light barrier. In a television series back in the seventy call 'Battle Star Galaxical', there was a seen where they met a species on the rim of the above class. They told the actors in the show that 'as you are now we once were and as we are now you may become.' I thought that the statement was profound and I still do. Unless we start to cherish ours diversities and take care of ours home we may not become.

This thought experiment does not dilute special relativity, it is a very useful and necessary tool to make sense of ours world and our universe when we make measurement of space and time from our rest frame. However, we must understand that no matter where we go or how fast we get there, we will always be in a rest frame which is universal to the observer location.

If we were in a universe where there was only sound and no light, we would be using special relativity when the velocity approach the speed of sound and we would be saying that nothing could have a velocity greater than the speed of sound. At present, we have sound and light to transmit information. However, that does not mean that in the universe these transmitters are the only one. For instance, we have only started to investigate entanglement. There may be an upper limit for entanglement transmission of information. Another one is the transmission or projection of thoughts. We may find other methods if we keep advancing.