DETECTION OF TACHYONS

Abstract

It is felt by many that faster-than-light particles (tachyons) exist though none has been detected so far. Is it really possible to detect these particles? Some methods are brought up.

Difficulties

We need light to bring images to our eyes when seeing or detecting. Should a particle, e.g., the theoretical tachyon, move at a velocity greater than that of light whereby light cannot catch up with it, how can this faster-than-light particle (tachyon) be detected? If such a faster-than-light particle does exist, we may never be able to detect it. Is there a solution?

The fact that tachyons have been brought up before means that there have been theories or speculations about faster than light travel, i.e., some scientists believe tachyons exist though this is not proven. For example, one theory by a reputable scientist has stated that when the universe first formed the velocity of light had been greater than it is now. While tachyons theoretically may have negative mass, photons which are light particles have no mass. So tachyons and light seem very different. Unless tachyons can be confirmed by experiment everything about them is conjecture and not scientific truth. As is implied by the questions above, this experimental confirmation appears to be a great hurdle.

Special Relativity stipulates that the velocity of light is constant and nothing can exceed this velocity. There appears to be many who disagree with this, claiming that the experiment which confirmed this was the result of a wrong interpretation. So, even an experiment can be subject to a wrong interpretation. There is however the possibility, no matter how small, that faster-than-light particles exist, though detection might pose a great problem.

Why is light necessary for detecting tachyons? Our eyes cannot see in the darkness, light is supposed to reflect the images into our eyes so that the images can be seen. In the case of the faster-than-light particle, if light particles are slower than it and cannot catch up with it, theoretically light cannot reflect its image back to our eyes or a sensitive detecting equipment (though it may not be correct in interpreting it this way). According to Einstein, a faster-than-light particle has negative mass/length, which implies that the faster-than-light particle has suddenly changed to the opposite direction in its travel path (which can be interpreted as traveling backwards in time). This seems weird and absurd. Perhaps this prompted Einstein to assert that the velocity of light is the maximum velocity any particle could travel at. Has there been any test to really confirm it?

Special Relativity also stipulates the slowing down of time when approaching the velocity of light. The slowing down of time as is reflected in a time-piece can be expected, not forgetting influencing factors such as air resistance, electromagnetic forces, gravitational forces, etc. Relativity is not really that logical and has inconsistencies if one looks closely into it. For example, for the velocity of light to remain constant relativity posits that the slowing down of time and the shortening of distance traveled have to be so at the same rate (which does not appear likely to be achievable), length contraction (as though the object is flexible like rubber), etc., that all look like fabrication to explain the constancy of the velocity of light which had apparently greatly puzzled Einstein. How can any particle not be able to exceed the velocity of light, when in quantum entanglement particles could appear instantaneously? In electronics, a TV signal transmitted from a broadcasting station can be received instantaneously in all the homes tuned to it at the same time. So far tachyons are only a speculation with no evidence of their existence, though some think they are not a crazy idea and can exist.

An interesting question: Though relativity shows that a tachyon travels back in time, couldn't it be forward in time? For example, a particle could transmit information to another particle instantaneously, i.e., faster than light velocity. Is this information transmitted through a carrier wave which travels faster than light, such as tachyons?

The difficulty of detecting tachyons cannot be understated. Perhaps quantum entanglement which had also stumped Einstein is a manifestation of presence of tachyons which is yet to be proved. Tachyons either do not exist, or, are moving too fast to be seen, or, they could have negated or annihilated the light particles when encountering the latter. It is all still a mystery.

A tachyon could be a negative mass particle though there is still no proof that negative mass particles exist. On the other hand, if negative mass particles/negative mass tachyons do not exist (i.e., only positive mass tachyons exist) there is a greater possibility of detecting tachyons, as light particles needed for the detection would not be negated or annihilated by these negative mass tachyons themselves (though if the light particles were indeed negated or annihilated it might be interpreted that negative mass tachyons exist, which explains why the light particles were negated or annihilated – this is only circumstantial evidence that negative mass tachyons exist).

If a tachyon is really a negative mass particle, there may be no way to detect it directly in the usual manner with light particles and the only way may be to use an indirect method of proof, i.e., relying on some kind of circumstantial evidence. But how do we really affirm that a tachyon is a negative mass particle and not a positive mass particle? This seems problematic. Maybe we have to just assume that the tachyon is negative mass, or, positive mass, and reason from there and see whether either assumption leads to any problems or contradictions. For example, in relativity Lorentz length contraction has no actual physical evidence to back it up and is only an inference

and practically everyone accepts its validity. Perhaps similarly inference is sufficient for proving the existence of the negative mass tachyon as actual physical evidence may not be possible to have at all. There is some merit in this method.

Possibility

Theoretically at least it may be possible to detect the velocity of an object (tachyon) exceeding the velocity of light without the utility of light as a detector. If it is possible to create a tachyon in the laboratory, it may be possible to time the path taken by the tachyon from creation to destination, like timing an athlete from the starting point to the finishing line. For example, the tachyon's creation activates a timer which stops when the tachyon hits an obstruction – the destination (synchronize the timer to perform this function). This time taken is the time the tachyon takes to travel from its propagator (creator – equipment) to its obstruction – destination. This is the most direct method of gauging the velocity of a tachyon.

REFERENCES

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