How to really exceed the speed of light

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Abstract:

In modern physics, people's explanation for the inability to exceed the speed of light is that the closer to the speed of light, the greater the mass or inertial mass of the object, and then more energy is required for acceleration, as a result, it can only approach the speed of light infinitely, but can't exceed the speed of light. The cornerstone of this theory is the mass-velocity relation： $M = m / \sqrt{1 - \frac{v^2}{c^2}}$. So, is the mass-velocity relation really an obstacle to exceeding the speed of light? How can we really exceed the speed of light?

Let me explain from the following three aspects:

1. It's not the mass or inertial mass that limits exceeding the speed of light.
2. What really limits exceeding the speed of light is the speed of the thrust.
3. Exceed the speed of light by means of multi-stage rockets.

Keywords:

Exceed speed of light; Kinetic energy equation; The mass-velocity relation; Inertial mass

1. It's not the mass or inertial mass that limits exceeding the speed of light

① Mass: We know that the increase in the mass of an object must be accompanied by an increase in the number of atoms. However, the accelerated object does not obtain atoms from the outside world, that is, the number of atoms remains unchanged. Then, even if accelerated to the speed of light, the mass of the object itself should remain the same.

② Inertial mass: Inertial mass is a force that prevents an object from moving when it is pushed by an external force. When the energy used to accelerate the object is completely converted into the kinetic energy of the object being accelerated, the kinetic energy of the object can be described by the kinetic energy equation: $Ek = mv^2/2$.

When the speed is doubled, the required energy quadruples, namely: $Ek = m(2v)^2/2 = 4 * mv^2/2$. That is to say, the faster the speed of the object, the greater its inertial mass (inertial mass is proportional to the square of the speed), and the greater the energy required for acceleration. Then, when the speed of light is reached, the kinetic energy of an object is: $Ek = mc^2/2$. Although it looks huge, it is not infinite. Therefore, the claim that it cannot be accelerated to the speed of light due to infinite inertial mass is likely to be false.

To sum up, neither mass nor inertial mass is the root cause of the inability to exceed the speed of light! Just imagine, will a celestial body flying at the speed of light close to or beyond the speed of light at the edge of the universe have infinite mass or inertial mass? Obviously not.

2. What really limits exceeding the speed of light is the speed of the thrust

According to Newton's laws of motion: F = ma, we know that an object only accelerates when it is subjected to a force. Such as when a pitcher while pitching, after the ball leaves the hand, it will not be affected by the force from the hand, that is, the maximum speed of the ball is at the moment it leaves the hand, and it is equal to the pushing speed of the hand.

So the same, we already know that the speed of propagation of electromagnetic waves, gravity, electric fields, etc. is the speed of light. In the accelerator of the modern laboratory, we use the above forces which not exceed the speed of light to push any object, then the object cannot exceed the speed of light. It's like a pitcher's hand can only push at 100 km/h, but want the speed of the ball to reach 200 km/h. Even without the constraints of the inertial mass, faster than the speed of light cannot be achieved with accelerators. The essence is that the speed of the thrust does not exceed the speed of light, so the object being pushed cannot exceed the speed of light.

3. Exceed the speed of light by means of multi-stage rockets

When humans put satellites into orbit, most of them use multi-stage rockets for acceleration, so that the rockets reach the first cosmic speed. Similarly, since only external thrust (electromagnetic waves, gravity, electric field, etc.) cannot be used to exceed the speed of light, then the external thrust can be used to first push the object to near the speed of light, and then the internal thrust (explosive force, atomic force, etc.) can be used to achieve secondary acceleration, so as to exceed to speed of light.

For example: will a celestial body flying at close to the speed of light at the edge of the universe produce superluminal matter when it explodes? I think the answer is yes. If the universe cannot expand faster than the speed of light at the time of the big bang, it can only be achieved through this kind of secondary acceleration or even multiple acceleration.

So, how to achieve superluminal speed in the laboratory? Perhaps, accelerating the atoms to close to the speed of light, and then exciting the atoms in some way (high temperature, high pressure, radiation, etc.) to release their own electrons, so that it is possible to generate electrons with superluminal speed.

Although, with the current science and technology, it is unknown whether electrons can be excited in the direction of motion of atoms, and how to measure whether electrons travel faster than light. However, I believe that human beings will one day be able to break

through this problem, or use other methods to achieve superluminal speed, proving this theory is correct.

The end

The speed of light not only limits human cognition, but also limits the pace of human exploration of the universe. One day, human beings will have to leave the earth on which they live, even the solar system and the Milky Way. I hope that my theory can bring hope to people in the future. Let them find their way forward in the vast universe!