

About anti-matter, negative mass, and negative energy

By Wan-Chung Hu

lukluk73_2006@yahoo.com.tw

Abstract

Anti-matter is thought to have positive mass and positive energy like matter. However, matter and anti-matter have opposite charge, spin, momentum, position vector, angle, angular momentum, hardon number, and lepton numbers. Only same positive energy and positive mass are shared by matter and anti-matter. This is not symmetrical. Here, I propose that anti-matter carries negative mass and negative energy and is moving backward from time arrow. Thus, matter and anti-matter are perfectly symmetrical.

Mani text

Matter and anti-matter have opposite charge, spin, momentum, position vector, angle, angular momentum, hardon number, and lepton numbers. Only same positive energy and positive mass are shared by matter and anti-matter. This is not symmetrical. Here, I propose that anti-matter carries negative mass and negative energy and is moving backward from time arrow. Thus, matter and anti-matter are perfectly symmetrical. This can help to explain Hawking radiation.

Base on uncertainty principles and Noether theorem, there are three relationships:

Momentum-position relation:

$$XP=(-X)(-P)=1/2h'$$

Angular momentum-angle relation:

$$L\theta=(-L)(-\theta)=1/2h'$$

We can see that matter and anti-matter are symmetrical. Thus,

Energy-time relation:

$$ET=(-E)(-T)=1/2h'$$

This says that anti-matter carries negative energy backward the time arrow. This solves Feynman and Dirac hypothesis.

And, because energy:

$$E=mc^2$$

Mass term should also be negative. This is to say anti-matter carries negative mass.

And, the mass in relativity:

$$M=m*dt/dT$$

If observed time and proper time have negative sign, then mass should also have negative sign. This explains why mass and energy can change relating to time.

Current theory thinks that anti-matter carries positive mass and positive energy. This could be due to that we measure anti-matter in the positive time arrow to jump into conclusion that anti-matter carries positive energy. Yau's positive mass theorem points out there are only positive masses. However, his theory is right because he uses causal structure which is positive time arrow. Actually, anti-matter carries negative mass and negative energy and moves backward in time.