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Compton Effect Obeys Newton's Law

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[Abstract] In 1932, Compton used Planck quantum hypothesis and mass-energy transformation formula to explain X-ray's scattering effect $\Delta\lambda=\frac{2h}{m_0c}\sin^2\frac{\varphi}{2}$. This article uses Planck quantum hypothesis and Newton's Law and gets the same conclusion $\Delta\lambda=\frac{2h}{m_0c_0}\sin^2\frac{\varphi}{2}$. Meanwhile, Chinese professor Wu Youxun made an experiment in 1926 and the conclusion anastomosed. Through analysis, we can see that Newton's Law is authoritative and comprehensive, but Einstein's mass-energy transformation formula has some defects. From this point of view, this article is challenging the relativity.

[Keywords] Compton, scattering, Newton, mass-energy relation

1 Introduction

In 1923, Compton used Planck quantum hypothesis hf and Einstein's mass-energy formula to explain X-ray's scattering effect, and the measuring result was $\Delta\lambda=\frac{2h}{m_0c}\sin^2\frac{\varphi}{2}$ which anastomosed the experiment. Then, the mass-energy formula of relativity made a great sensation in the whole world. [In order not to confuse the readers, we still call Newton mass as m_0, and Einstein mass as m. But the light velocity of light source radiation must be c_0.]

Chinese professor Wu Youxun made the same experiment in 1926, the conclusion was: ①for the material with less atomic mass, Compton's scattering effect is stronger, and for the material with more atomic mass, Compton's scattering effect is weaker; ②Wavelength shift $\Delta\lambda=\lambda-\lambda_0$ varies with scattering angle φ (the angle of the extension line between scattered and incident lines); when the scattering angle increases, wavelength shift will increase too; while in the same scattering angle, for all the scatters, wavelength shifts $\Delta\lambda$ are the same. Compare the two professors' conclusions, we can see that professor Wu Youxun's conclusion is more comprehensive and more clear. [In this article, considering the error habit in the history, we still call Newton mass as m_0, and Einstein mass as m. But in fact, the mass is the constant mass because of conservation of mass. c_0 refers to Einstein's light velocity, that is radiation velocity of photon.]

This article used Planck quantum hypothesis + Newton's Law and got the same conclusion

$\Delta\lambda = \frac{2h}{m_0 c_0}\sin^2\frac{\varphi}{2}$. It anastomosed the experiment conclusion of Chinese professor Wu Youxun, who made the experiment in 1926. Through analysis, we can see that Newton's law is also suitable to the scattering materials in high speed, and it is comprehensive and authoritative, but Einstein's mass-energy transformation formula has some defects.

2 Use Newton's Law to Explain Compton Effect

In the research of heat emission, Planck made a Planck energy quantum hypothesis in 1900: for harmonic oscillator in frequency f, the minimum energy quantum is $\varepsilon = hf$, where $h = 6.626\times10^{-34}\,J\cdot S$, which is called Planck constant. Under this quantum hypothesis, derived formula consists with the experiment.

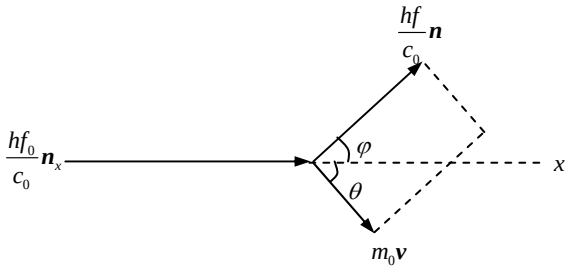

Figure 1 Model analysis of Compton effect

Now on the premise of quantum theory, we calculate the changing situation of wavelength when the minimum energy quantum hf (named photon) collides a free electron. As shown in figure 1, suppose electron is still (the velocity of electron on the scatter is zero relative to the velocity of light source), then the light wave in frequency f_0 moves along x axis. So, after colliding the electron, an energy quantum with energy hf_0 and momentum $\frac{hf_0}{c_0}\boldsymbol{n}_x$ ($\boldsymbol{n}_x$ is vector of unit direction, and is the velocity of propagation of light wave relative to light source, that is relative velocity watched by scatter) will be scattered, and form a φ angle with original incidence direction. After the electron with mass m_0 being collided, its energy changes to $\frac{1}{2}m_0v^2$ and momentum changes to $m_0\boldsymbol{v}$. At the same time, the energy of scattering energy quantum (or photon) changes to hf and momentum changes to $\frac{hf}{c_0}\boldsymbol{n}$ ($\boldsymbol{n}$ is vector of unit direction of collided energy quantum).

According to law of conservation of energy and law of conservation of momentum, it is easy to get the following identical equation.

2.1. After the still electron is collided by photon, it gets the kinetic energy, and the energy relation is:

$$\frac{1}{2}m_0v^2 = hf_0 - hf \tag{1}$$

Both sides of the equation multiply 2, get the result:

$$m_0 v^2 = 2hf_0 - 2hf \tag{2}$$

Then, take a square, get the result:

$$m_0^2 v^4 = 4(hf_0)^2 + 4(hf)^2 - 8h^2 f_0 f \tag{3}$$

2.2 After the still electron is collided by photon, it gets the momentum, and the momentum relation is:

$$m_0 \boldsymbol{v} = \frac{hf_0}{c_0}\boldsymbol{e}_0 - \frac{hf}{c_0}\boldsymbol{e}_1 \tag{4}$$

Use the parallelogram law of vector superposition, get the result:

$$(m_0 v)^2 = (\frac{hf_0}{c_0})^2 + (\frac{hf}{c_0})^2 - 2\frac{hf_0}{c_0}\frac{hf}{c_0}\cos\varphi \tag{5}$$

Both sides of the equation multiply $4c_0^2$, get the result:

$$4m_0^2 v^2 c_0^2 = 4(hf_0)^2 + 4(hf)^2 - 8h^2 f_0 f\cos\varphi \tag{6}$$

Formula (6) subtracts formula (3), get the result:

$$m_0^2 v^2 (4c_0^2 - v^2) = 8h^2 f_0 f(1-\cos\varphi) \tag{7}$$

Put formula (2) into formula (7), get the result:

$$m_0 (4c_0^2 - v^2)(2hf_0 - 2hf) = 8h^2 f_0 f(1-\cos\varphi) \tag{8}$$

That is:

$$m_0 (4c_0^2 - v^2)(f_0 - f) = 4hf_0 f(1-\cos\varphi) \tag{9}$$

$$m_0 c_0^2 (4 - \frac{v^2}{c_0^2})(f_0 - f) = 4hf_0 f(1-\cos\varphi) \tag{10}$$

$$c_0 f_0 - c_0 f = \frac{4hf_0 f(1-\cos\varphi)}{m_0 c_0 (4 - \frac{v^2}{c_0^2})} \tag{11}$$

Both sides of the formula (11) divide $f_0 f$, get the result:

$$\frac{c_0}{f} - \frac{c_0}{f_0} = \frac{4h(1-\cos\varphi)}{m_0 c(4 - \frac{v^2}{c_0^2})} \tag{12}$$

Through the identical equation $f = \frac{c_0}{\lambda}$, get the result:

$$\lambda - \lambda_0 = \frac{4h(1-\cos\varphi)}{m_0 c_0 (4 - \frac{v^2}{c_0^2})} \tag{13}$$

$$\lambda - \lambda_0 = \frac{h(1-\cos\varphi)}{m_0 c_0 (1 - \frac{v^2}{4c_0^2})} \tag{14}$$

$$\Delta\lambda = \frac{2h}{m_0 c_0 (1 - \frac{v^2}{4c_0^2})} \sin^2 \frac{\varphi}{2} \tag{15}$$

This result is derived through Newton's kinetic energy and momentum. Because the momentum obtained by a still electron collided by a photon, that is $\frac{v^2}{4c_0^2} \ll 1$, so formula (15) is:

$$\Delta\lambda = \frac{2h}{m_0 c_0} \sin^2 \frac{\varphi}{2} \tag{16}$$

That is to say formula (15) is the explanation of Newton's law, and formula (16) is the approximate explanation of Newton's law, so formula (15) is the exact one.

Compton used mass-energy relation and Planck quantum theory to derive and got formula (16). As to the measurement in the experiment, both have high enough accuracy. Just considering this point, as relativist always says, relativity and Newton's law only have high level dimensionless difference.

But, from the view of comprehensive physical conception, this article thinks that formula (15) is the exact explanation and formula (16) is the approximate explanation. Since it is energy exchange in collision, formula of exchange relation should reflect the velocity of energy receiver (electron), that is to say: $\Delta\lambda$ offset should have some function of electron velocity, although this functional relation is tiny, the function should reflect the tiny change. From the physical view, if photon collides the electron bound tightly by atom, electron will exchange energy with the whole atom, but atom's mass is much larger than electron's mass, according to collision theory, electron will not loss too much energy, that means the frequency of scattering light will not change a lot. The more atoms' mass (that means atomic nucleus is larger), the more binding force of atomic nucleus; the lower velocity obtained by electron, the weaker scattering intensity. That means velocity obtained by electron has relation with scattering intensity, formula (15) describes this relation. Slow velocity, large denominator, weak scattering intensity. Hence，formula (15) is more comprehensive and authoritative. To be exact, Newton theory and Planck quantum theory are more comprehensive and authoritative.

3 Mass-energy Relation is not Consistent with Awarded Quantum Entanglement

Talking about the mass-energy relation of relativity was quite modern in the past, and some persons entitled with relativist seemed to have higher academic level. But the result was quite bad. Such as de Broglie and other persons, they used mass-energy relation to define matter wave: a object with mass m_0 is moving at the speed of v, and its total energy is:

$$E_{总} = mc_0^2 = hf \tag{17}$$

Its total momentum is:

$$P_{总} = mv = \frac{hf}{c_0} \tag{18}$$

Through the above constant formula $c_0 = \lambda f$, we can see that moving object has the following wave length of monochromatic wave:

$$\lambda = \frac{h}{mv} \tag{19}$$

Where $m = \frac{m_0}{\sqrt{1-\beta^2}}$ is the mass of relativity.

Please notice: de Broglie defined "total energy of the moving object is mc_0^2, and the total momentum is mv", it showed that de Broglie used mass-energy relation formula of relativity to define.

It must be noted that: according mass-energy relation formula definition of relativity, the total energy produced by Hydrogen atom's electron moving around nucleus is mc_0^2, and the total momentum is mv, now formula (17) divided by formula (19) is:

$$\frac{E_{总}}{P_{总}} = \frac{mc_0^2}{mv} = \frac{hf}{hf/c_0} \tag{20}$$

That is:

$$\frac{c_0^2}{v} = \frac{c_0}{1} \tag{21}$$

or

$$v = c_0 \tag{22}$$

In other words, the velocity of electron moving around the nucleus is c_0. If it is moon, that means moon speed is equal to light velocity c_0? This error is caused by mass-energy transformation formula of relativity.

Take an other example, if formula （19） uses relativity's mass, the result will be:

$$\lambda = \frac{h}{m_0 v}\sqrt{1-\beta^2} \tag{23}$$

As to the light, when $v = c_0$, $\beta = 1$, that is $\lambda = 0$. This means all the wavelengths are zero. This theory is based on the light theory, but can't examine the wavelength of light, it is ridiculous. So, Einstein's relativity has contradictions with his rewarded quantum entanglement. I would rather believe quantum entanglement than "I am her in the preexistence".

Of course, de Broglie, Davidson and Germer did not use Einstein's mass m but Newton's mass m_0 in their "the reflecting current on crystal and accelerating potential difference of electron" experiments, rather not Einstein's mass-energy relation, this is called "Say one thing and mean another". To be exact, this is "Say one thing and do another". They wrote articles with the title of relativist, but they used Newton's law to do the experiment. [There are many examples like this.]

From the view of physical principle, Einstein defined that energy and momentum are not consistent. After he defined the total energy mc_0^2, he found that it was far from the reality, then he defined so-called "static energy" $m_0c_0^2$ in order to be similar to the momentum after being subtracted. But he couldn't define static momentum, and so-called static energy was the static

energy in the reference system. Since relativity did not admit the absolute static space, where did the static energy come from? We think Newton's law is perfect, derivative found by kinetic energy and velocity is momentum, simple and wonderful. But relativity is always strange. After relativity rewrote the build-in attribute (mass) of object, the kinetic mass lead to the result "Special relativity is not consistent with human's engineering practice", pointed out in article 1.

4 Conclusion

In a word, as to Compton's roentgen ray scattering experiment, through analyzing formula (15) , we get the result: Newton theory is more comprehensive and authoritative. This indicates that Newton's law is not only examined in macro area and real life & job, but also examined in micro area, then Einstein's mass-energy relation formula is destabilized.

This article re-explains the historic physical experiment, the physical conception is quite clear, and there are no importunate words in it, and the article reveals the true features of the object. This chapter just explains some important experiments of special relativity. As for physical events of general relativity, including astronomical observation, someone wrote articles with the title of relativist and seemed to have higher academic level, but their practical operations were different. My time can't dilate or stop or move backward, so I do not have enough time and ability to explain astronomical event listed in the books of general relativity. So, I'm here calling on the specialist in relative area to explore science truth and research the supertitionist's excuse of general relativity, give the physical phenomenon true physical explanation, use the contorted physical events to make right judgment and achieve the goal of clarifying some facts.

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