

## **THEORY OF PAIR PRODUCTION BASED ON SURAH AS-SAJDAH VERSE 5 ACCORDING TO THE INTERPRETATION OF JALALAIN**

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### **Abstract**

In everyday life human life is not independent of physical elements. Among the physical phenomena we can encounter is the creation of energy shut up. In the fabric here there are several roles like electrons, atoms, Photons, and so on. In modern physics, it is called as pair production theory. This phenomenon only happens in light with high speeds, so it can be difficult to be observed directly. Relating to that phenomenon, the surah as-sajdah verse 5 said that light can be known in depth through the interpretation of Jalalain written by Imam Jalaluddin Al-Mahalli and Imam Jalaluddin As-Suyuthi.

*Keywords: modern physics, pair production, as-sajdah, interpretation book*

### **Abstrak**

Kehidupan manusia sehari-hari tidak terlepas dari adanya unsur fisika. Salah satu fenomena fisika yang dapat kita temui adalah adanya penciptaan Energi Diam. Pada pembentukannya disini terdapat beberapa peran seperti elektron, atom, foton, dan lainnya. Hal ini dalam dunia Fisika Modern dapat dijelaskan dengan menggunakan teori Produksi Pasangan. Fenomena ini hanya terjadi pada cahaya dengan kecepatan yang tinggi, sehingga akan sangat sulit jika diamati secara langsung. Berkaitan dengan hal tersebut, dalam Al-qur'an surah As-Sajdah ayat 5, berbicara tentang cahaya yang dapat diketahui maknanya secara mendalam melalui kitab tafsir jalalain karya Imam Jalaluddin Al-Mahalli dan Imam Jalaluddin As-Suyuthi.

*Kata kunci: fisika modern, produksi pasangan, as-sajadah, kitab tafsir*

### **Introduction**

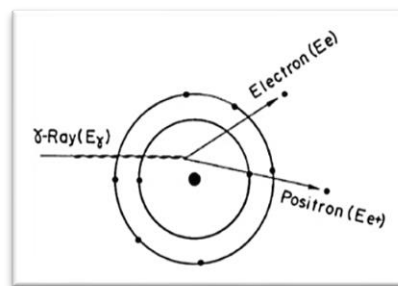
The apparition of the universe was so amazing it stored that science. The discussion will never end the continuing expansion of science. Advancing as the ages is capable of bringing uplift and supporting the lives of creatures in his lifetime. Concepts of knowledge Perfectly wrapped in the implementation of a theory unfettered of thought A growing man. The source of science is not exempt from the creation of nature by God almighty. Hence, it often happens A dichotomy between science and religion. Science and religion are two complementary sides. The purpose of both is to live for More human beings. Integrating related sciences. Capable of deepening the proddings of human knowledge for the advancement of time. This is the wrong one that can be observed through the development of physical science.

Modern physics is one of the most advanced concentrations of physics. Can It be known that understanding concepts are needed in understanding modern physics relating to experimentation? And the production materials of pair production are no exception. Where this pair's production is not random and only under certain circumstances. Logically, the production of a pair cannot be overridden. Necessary A particular experiment or experiment, to prove its existence. Event the production of a pair does not fall apart from a

story that is written in the Qur'an. One scripture In the Qur'an that talks about the production of a pair is surah Qur'an As-Sajdah verse 5. As a science student and a Muslim, it should be possible to religious study. It's later able to bring students to science vast knowledge and ignorance. Other than scientific mastery students can become conscious of the existence of science regardless of the almighty's power Allah SWT. and religion.

### Pair Production

Simply production of a pair is a process that occurs when photons meet atoms, where photons lose all their energy and the process is experiencing the formation of two particles, namely electrons and positrons. The positron is a particle that has an identical mass to an electron, but it still has a positive electrical charge. Until then this electron did not exist, electrons exist because there was a meeting between photons with atoms (Krane, 2012). So it would also mean that production is in pairs Is the process of forming a pair of electrons and positrons (positive electrons) when the energy of the photon is absorbed entirely by the impact of the atomic core fields (Akrom, 2014).



**Picture 1.** Ionization Process Pair Production  
**Source :** Ramesh Chandra, 2004

The photon energy of  $hf$  is converted into relativistic energy  $E_+$  dan  $E_-$  from positron and electron formed, so it can be formulated as follows:

$$hf = E_+ + E_- = (m_e c^2 + K_+) + (m_e c^2 + K_-)$$

We need to know that the "K" also is a positive one, so photons must have energy  $2m_e c^2$  is equivalent 1.02 MeV to enable expected processes. At energy with that value, the photons with that energy are in the beam region Nuclear gamma. We can symbolically state the following:



A process like the bremsstrahlung (electromagnetic radiation emitted by high-velocity charged particles when it loses energy and is deflected as a result of its velocity near the atomic nucleus), where processes aren't gonna happen unless they're atomic nearby, to be able to provide or supply the momentum recoil- momentum law required. So it can be there is a reverse process, that is :



It also occurs in a process or event that can be known as genocide the elec-positrons and the free electrons and the positrons that makeup at least there are two photons. In this process,

the electrons and the positrons will disappear and be replaced by two photons. So that conservation is formed becomes:

$$(m_e c^2 + K_+) + (m_e c^2 + K_-) = E_1 + E_2$$

Where  $E_1$  and  $E_2$  are energy photons. And so we know that the conversion momentum takes two photons to have the same moment and direction opposite and equal energy. So the two photons of extermination haven the same energy would be 0.511 MeV ( $=m_e c^2$ ) and move in opposite ways (Krane, 2012).

### Tafsir al-Qur'an Surah As-Sajadah verse 5

In surah as-sajdah verse 5 this is interpreted by the interpretation of the Jalalain literal translation Imam Jalaluddin Al-Mahalli and Imam Jalaluddin As-Suyuthi. We need to know that tafsir Jalalain is an interpretation using the form al-ra 'yi. Interpretation taken is by interpreting verse after verse that uses the ijihad of the mufasir. It is It was done to determine the most precise meaning, using history and the history of the prophet (peace and blessings be upon him). His companion's tabi'in, and tabi'ut tabi'in (Rusli, 2021).

Allah Subhanahu Wa Ta'ala saying:

يُدَبِّرُ الْأُمْرَ مِنَ السَّمَاءِ إِلَى الْأَرْضِ ثُمَّ يَعْرُجُ إِلَيْهِ فِي يَوْمٍ كَانَ مِقْدَارُهُ أَلْفَ سَنَةٍ مِمَّا تَعُدُّونَ

It means: "He governs all affairs from heaven to earth, and then (business) it rises To him in one day whose extent (length) is a thousand years according your calculations." As-sajdah 32: verse 5)

The verse has an interpretation, according to the Imam Jalaluddin Al-Mahalli and Imam Jalaluddin As-Suyuthi in his book tafsir Jalalain, as follows (Harry) :

*"He governs the affairs of heaven to earth) as long as there is a world (then up) of business as well as arrangement (to him in a day that is a length of time a thousand years according to Your calculations) that are in the world. As well as the surah of al-ma 'arij verse 4 also states that That period is fifty thousand years old. The meaning of the sentence is that the moment of the day The end of the world for the heathen seemed so long because of its sheer horror. It is different with A person who has faith in the almighty god feels as if he is only a short time, even his time It'll be shorter than one fraud dish he does in the world. Thus "According to what is described in the hadith."*

### Method

The method of research used in this article is library research (research Literature) that is done by reading books, journals, or resources other literature for data that deals with discussion this article. The primary data source used is a book of modern physics written by Kenneth krane and kitab tafsir of Imam Jalaluddin Al-Mahalli and Imam Jalaluddin As-Suyuthi, while the secondary data source is a journal.

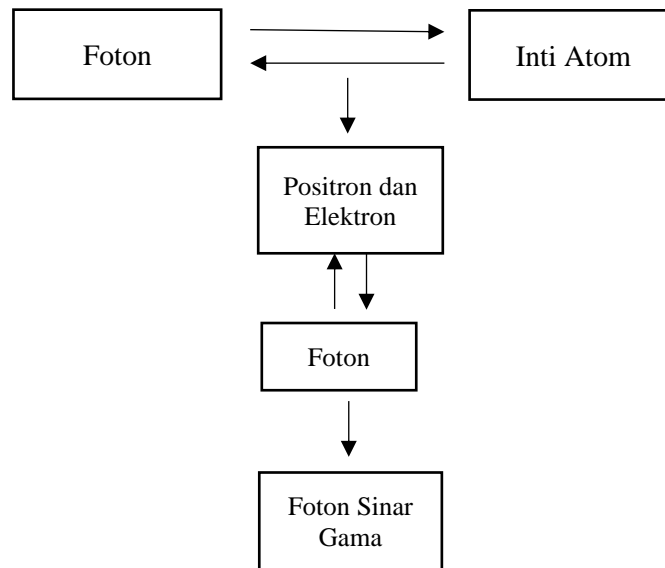
### Result and Discussion

In the process that the production of a pair is not independent of the role of light or rays as a media of the events that occurred. We need to remember that in a way a simple pair production is a process that happens when photons meet atoms, where photons lose all their energy and the process is experiencing the formation of two particles, namely electrons and positrons. The events of the production couples don't happen without a photon. We can understand it in general related.

Photons as follows (Krane, 2012) :

- Photons travel at the speed of light
- It has zero mass and silent energy
- Have energy and momentum, which are associated with frequency and length waves of electromagnetic waves with  $E = hf$  and  $p = h/\lambda$
- Can be created or destroyed when radiation is emitted or absorbed
- Both particles collide with each other like an electron

Now, in a nutshell the formation of an electron and a positron now both originate in the production of an electron couples are the result of exposure. In a production pair happens also the event of annihilation, it formed when the photons formed came from gamma ray. This we can illustrate in this way :



Scientifically, the occurrence of events in the production of couples can be explained scientifically. But as the age and knowledge of man increased. Found Some of the science that still has to do with the production of the couple. False That one science is a verse found in the holy book of Islam, the qur 'an. The passage relating to the production of the pair lies in the al-The qur 'an surah as-sajdah verse 5. Interpretation of that scripture with the production of a starring couple According to the book tafsir imam jalaluddin al-mahalli and Imam jalaluddin as-suyuthi. In the book is written a verse and an interpretation with It's the following Arabic (Al-Mahalli) :

(يُدَبِّرُ الْأَمْرَ مِنَ السَّمَاءِ إِلَى الْأَرْضِ) مدة الدنيا (نَمْ يَعْرِجُ) يرجع الأمر والتدبير  
 (الْيَوْمَ فِي يَوْمٍ كَانَ مِقْدَارُهُ أَلْفَ سَنَةٍ مِمَّا تَعُدُّونَ)  
 في الدنيا وفي سورة سأل خمسين ألف سنة وهو يوم القيامة لشدة أهواله بالنسبة الى الكافر وأما المؤمن فيكون أخف  
 عليه من صلاة مكتوبة يصلحها في الدنيا كما جاء في الحديث

The tafsir surah as-sajdah verse 5 above has an explanation that is, that in the sentence First (he governs the affairs of heaven and earth) while there is still a world. Sentence The second (then he rose) the affair and the arrangement. The third sentence (to him one day its size (length) is a thousand years according to your calculations) that Kadar It was fifty thousand years. What it means is that the time of the end is for the infidels to feel so long since they're terrible. It is different with A man of faith who feels as if his time is short even shorter. Then the one fardu prayer he does in the world. So it states It's explained in the hadith.

Related to the production of a pair that the photon, which is the main character the events of the production of the couple were described as the mukmin It is mentioned in the verse. The photons moving at a light-speed of 1.02 MeV movements hit the atomic core pretty fast. When A photon does not reach the speed of light, which is very difficult to occur collision between the photons and the atomic cores. Photons of movement at the speed of light are not we can easily imagine. This harmonizes with the interpretation of the above third sentence (الَّذِي فِي يَوْمٍ كَانَ مِقْدَارُهُ أَلْفَ سَنَةٍ مِمَّا تَعُدُّونَ) that states that "it is different with A man of faith feels as if his time is short even shorter Than the one fardu prayer he does in the world."

In a discussion of the speed of a photon that we may not be able to imagine as quickly what it represents has been written so precisely in the mushaf qur'an. How can we imagine the speed in other realms faster than ours Running prayers when that assurance of ease was only given to people just mukmin. So the qur'an explains, and a muslim's obligation is mandatory you believe it, because god promises you never break. In harmony with that then the pair production theory would never have occurred without a moving photon at the speed of light to hit an atomic nucleus.

### Conclusion

The pair production can't be all that exciting. Experiment in progress or specific experiments, to be able to prove its existence. Production events Couples don't miss a story that's written in the qur'an. One of the verses in the qur'an that deals with the production of a mate is the surah as-sajdah verse 5. The interpretation of the verse is interpreted according to the interpretive book of tafsir which is the work of Imam Jalaluddin Al-Mahalli and Imam Jalaluddin As-Suyuthi. It brings us together at the speed of a photon, which we may not be able to imagine as soon as possible what. The book of Jalalin has written with his rape-up tied to the speed of feeling It was as if his time was even shorter than one the fardu he did in the world when assurance of ease was only given to mukmin alone.

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