

## Two states of spin determined by magnetic field (not a property of elementary particles)

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Abstract

Stern-Gerlach's experiments revealed that electrons have two states of spin, in addition to their orbital magnetic moment. However, I question the interpretation of this result.

In this experiment, the electron beam that passed through the inhomogeneous magnetic field split neatly into upper and lower parts, I think that this was not because the electrons had two states of spin, up spin, and down spin, but because of the relationship with the inhomogeneous magnetic field. This became clearer through experiments conducted by the High Energy Accelerator Research Organization (KEK). KEK is unaware of this. However, if we use the electron model of energy body theory, it becomes clear. In addition, the electron model of the energy body theory also explains the reason and mechanism why the spin angular momentum is  $\pm 1/2$ .

### 2. Stern-Gerlach experiment

The famous Stern-Gerlach experiment confirmed that electrons have a magnetic moment (called a Bohr magneton) that creates two upward and downward states (up-spin and down-spin). The beam of silver particles that passed through the nonuniform magnetic field was clearly separated into upper and lower parts. It is known that the spin of a silver atom is determined by the spin of a single electron in the outer core. There was a magnetic field in the space in which the silver atoms were moving, and the silver atoms were divided into two groups: those heading towards the S pole and those heading towards the N pole.

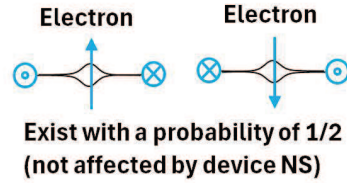
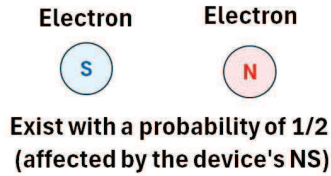
### 3. Stern-Gerlach's experimental interpretation

I question this interpretation. The up spin towards the N pole and the down spin towards the S pole are clearly divided into two. Stern-Gerlach's experimental setup creates a non-uniform magnetic field. Therefore, many silver atoms should gather on the N pole side where the magnetic field is concentrated. Moreover, it cannot be explained why the spin has  $1/2$  the angular momentum.

In contrast, the spin model of the energy body theory can clearly explain that electrons move up and down with a probability of  $1/2$ . Of course, it clearly explains why spin has  $1/2$  angular momentum. This alone shows that the electron-spin model of the energy body theory is correct. Fig.1

## Interpreting Stern-Gerlach's experiment by energy body

### Plan view



### Front view

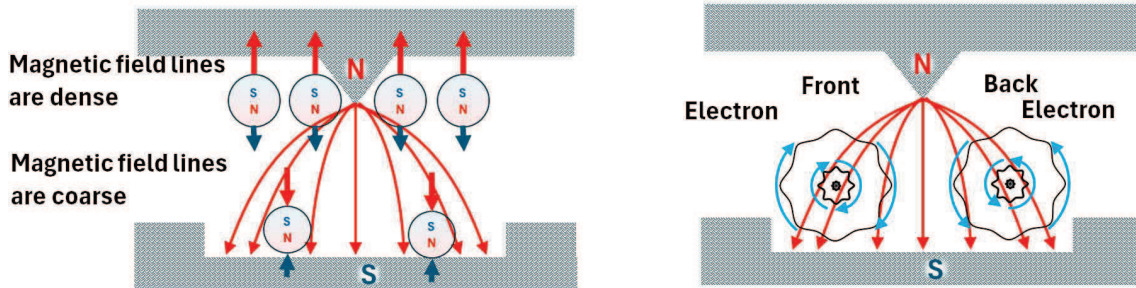


Fig. 1

## 4. Experiments at High Energy Accelerator Research Organization

Furthermore, an important experiment (currently unknown) that would leave its name in the history of physics was an extension of the Stern-Gerlach experiment conducted by Japan's High Energy Accelerator Research Organization (KEK). This experiment confirmed the electron-spin model of energy field theory.

The upper beam, separated by Stern-Gerlach's experimental device, was passed through another connected Stern-Gerlach experimental device. If electrons have the property of a magnetic moment called a Bohr magneton, then the beam coming out of the second experimental device must all be concentrated on the upper side. However, the beam was clearly separated into upper and lower parts. KEK attributed this reason to quantum. This point is a little disappointing. Fig.2

If we use the electron's spin model of the energy body theory, we can naturally expect that the beam coming out of the second experimental device will also be separated vertically. We can now say that the electron's spin model of the energy body theory is confirmed. This is why I have said that the High Energy Accelerator Research Organization (KEK) experiment is the one that will leave its mark on the history of physics. Fig.3

Extension of Stern-Gerlach experiment (conducted by High Energy Accelerator Research Organization)

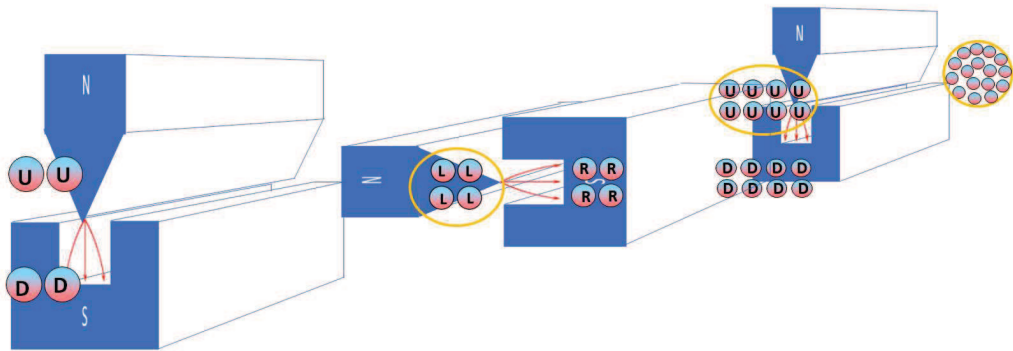


Fig.2

**Comparison of spin and spin direction between quantum mechanics and energy body theory**

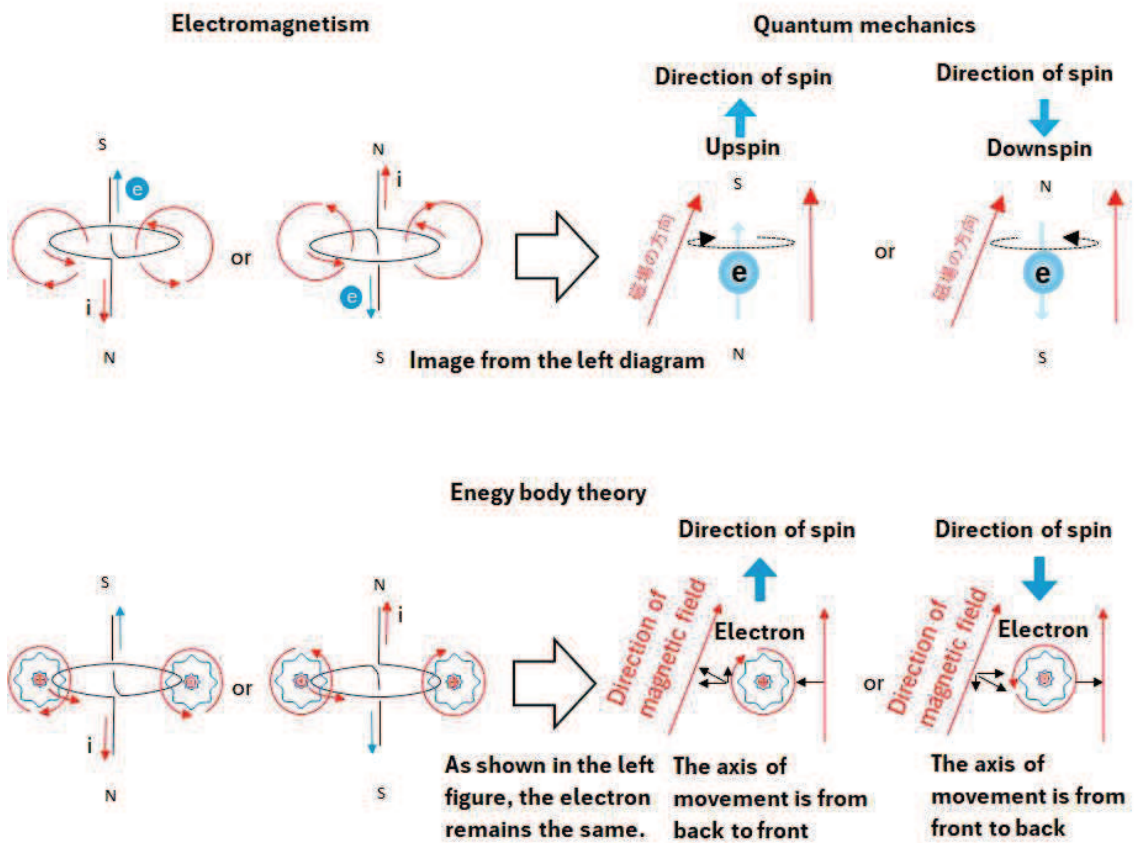


Fig. 3

**5. Conclusion**

Through Stern-Gerlach's experiments and the High Energy Accelerator Research Organization's experiments, we believe that the spin model of the energy body theory has

become definitive. Furthermore, the electron model of the energy body theory also presents the reason and mechanism why the spin becomes  $1/2$  the angular momentum.

## **5. Reference**

“How to see the quantum world: What is spin?” In Japanese Yoichi Murakami Kodansha