

*some text for a contemplation imagery of relationship of magnetism and electron and for manifestation of it*

One of familiar magnet for us is called ferrite magnet which has ferri magnetism. The purpose of the interdisciplinary apparatus here is a making variations of magnet force caused by some disturbance of electron by heat.

Molecules that make up matter are made up of bonds of various atoms, and the atoms consist of nucleus and electrons, and the electrons play an extremely important role in the bonding of each atom in the relationship between the nucleus and the electrons. The nucleus is consisting of protons and neutrons at the center of an atom, furthermore several kinds of elementary particles or fundamental particles have been discovered after 20 century. The elementary particles are constructing nucleus and protons, and are a subatomic particle with no sub structure, thus not composed of other particles. Electron is one of the elementary particles. The nature of electron is keeping in the bonding of each atom and molecule, and is forming matter that it is possible for us to be perceptive in our customary sense. And also an extensively migration of huge volume of electrons is utilized for us as electricity in nowadays life. In a way, the elementary particle most familiar for us is an electron.

On the other hand, an electron has unknown aspects there are. For instance, an electron has mass, but we don't know the size, no we don't even know whether it's possible to apply that idea of size or not. In the old days, we had thought a shape of electron such as globose. It no longer has shape nowadays. And the image of it is like gas or cloud which we are thinking. This may be pointing out the idea of shape, which is on extension of space, and which is on our customary forms of perception, cannot be applied moreove r. Or our forms of perception may be incompatible with natural phenomena rather.

When the migration of volume of electrons, i.e. electric current happens, it makes magnetism around the motion of electrons at the same time. This is a magnetic force what the real nature indicates, and is known as electromagnetic dynamics. Admittedly we generally know it as coil, but how is working in a case of permanent magnet? There is no connection of any electricity, no energization. Rather the ferrite magnet is ceramics as know as nonconductor. When we think about the magnetic force of permanent magnetic, the question is where that comes from. Then we have to start to think about the motion of electrons that are locked into matter. We should make any image of that. Again, back to the old days, we have had an image of electron running around nucleus. In this case, it was possible for us to have an image that electrons moving along a certain trajectory generate magnetism. Obviously this image is not suitable for actual fact. But electrons which are surrounding nucleus have something of momentum that is similar as circular movement. It is called as "orbital angular momentum". Orbital angular momentum is one of sources to generate magnetic force, but it is not so effective. Because the plural electrons exist in an atom, and the electrons are arranged to be offset the orbital angular momentum of each other, cause to be more stable.

We can think of another motion of electron. The classical image what we have is a momentum for rotation of electron itself that is such as globose shape of electron. Though this is obviously no suitable image as well. It is quite hard for us to make an image of spinning of a single electron like gas. Anyway the elementary particles have momentum which is called as "spin angular momentum" or just "spin." And the momentum characterizes types of each elementary particles. An electron has a certain "spin angular momentum" too, and the plural electrons in an atom are arranged to be offset the spin angular momentum of each other. But a few of electrons is not canceled and the moment remains. When an each electron which has a moment of itself is gathered numerous number and makes a certain structure of an atom, molecule and even crystal, the total moments

arise a specific bias in some case. Then the structure that has the bias forms matter as a physical object and it is called as a permanent magnet. In this meaning, we can regard as the magnetism of a permanent magnet is an appearance of magnetic moment which is a total amount of the orbital angular momentum and the spin angular momentum. Matter which has no magnetism is that orientations of each spin angular momentum of electrons vary. Matter such as that is general and the orientation of spin is being disturbed by heat.

Ferri magnetism has a certain bias which consists of two opposite orientations by the spins, and one is stronger than the other, and the difference of strongness makes a magnetic force of ferrite. It is possible to shake up the orientations of each spins by giving heat more than a normal temperature, the average of the orientations becomes uneven then the magnetic force decreases. We call it as demagnetization. In the case of the temperature lower than a certain point, when the heating stops and the temperature goes back down, the strongness of magnetic force takes back –i.e. the reaction has a reversibility. If the temperature has been even once above the certain point, then when the temperature is down, the strongness of magnetic force never comes back again. The orientations of each spin angular momentum of electrons have left varying. That certain point of temperature is called Curie temperature that the value of temperature depends on difference of matter.

Let me think an apparatus in order to display a process of giving a heat to a ferrite magnet till a point lower than the curie temperature and of appearing of the transient variations as demagnetization effects. This indicates a manifestation from variations of orientations of spin of electron which is an elementary particle and has still unknown aspects. My purpose is to create that apparatus working any imagination of us by thinking of nature of electron. This apparatus has a possibility that is directly observing a manifestation from a world that lies outside the domain of a causal description corresponding with our customary forms of perception. That might become a question from an actual nature world for us who are bonded by a determinacy idea of causality.

***Disturbance of Magnetic Moment : Switching Apparatus***

The ferrite magnet is heated by the halogen, and the orientation of spins direction is disturbed, and demagnetization happens, and then the balance between magnetic forces is lost, and an electrical contact is separated, and the heating is stopped, and the natural cooling begins, and then the orientation of spins begins to align again, and the magnetic force is restored, and the electric contact is connected, and the heating begins. This repeated process is a switching apparatus for a natural phenomenon that repeats connection and disconnection at indeterminacy timing.

***Disturbance of Magnetic Moment : Displacement Apparatus***

The ferrite magnet is heated by the halogen, and the orientation of spins direction is disturbed, and the demagnetization happens, and then the repulsion to gravity is reduced, and the height is lowered, and the boundary conditions of a string change, and the entire vibration suffers the effects, and then the vibration of the monocode changes. This device, which produces a height of about 5 mm variation in 60 minutes, affects the entire vibration system by making the subtle displacement a change in the boundary condition of one string, and manifests it as a change in vibration.