

Is The Flow of Field Energy Responsible for Electromagnetic Field Momentum?

Shivpal Chellam*

Department of physics, Banaras Hindu University, India

Shivpal342@gmail.com

Abstract

The electromagnetic force, also known as the Frictional force, is used to define electromagnetic phenomena, which encompasses both electricity and magnetism as distinct manifestations of the same phenomenon. The electromagnetic force is a major factor in defining the interior properties of most everyday items.

1 Introduction

Atoms are held together by the electromagnetic attraction between their nuclei and orbiting electrons. Chemical bonds between atoms, which form molecules and intermolecular forces, are both governed by electromagnetic forces. All chemical processes that originate from interactions between electrons of different atoms are mediated by the electromagnetic force.

2 Forces of Nature

The electromagnetic force is one of the four known fundamental forces. The other fundamental forces are the large and powerful nuclear force binds electrons and nucleons together to create nuclei. The weak nuclear force binds to all known particles in the Standard Model and produces radioactive decay in certain forms. However, in particle physics, the electroweak interaction is the unified account of two of nature's four fundamental interactions: electromagnetism and the weak interaction

Maxwell's equations continue to provide a complete and elegant account of electromagnetic down to the subatomic scale, but not including it. In the twentieth century, however, his work's interpretation was widened. In Einstein's special relativity theory, electric and magnetic fields were combined into a single field, and all matter's velocity was confined to that of electromagnetic radiation.

Physicists found that other forces in nature have fields with a mathematical structure similar to the electromagnetic field in the late 1960's. The principle of charge conservation, like Coulomb's law, is a natural law. The charge of an isolated system cannot vary according to this principle. If a system contains an additional positively charged particle, a particle with a negative charge of the same magnitude will be formed at the same moment, preserving the principle of charge conservation.

When high energy radiation interacts with matter in nature, a pair of oppositely charged particles known as an electron and a positron is generated in a process known as pair formation. Magnetic fields are produced by more than just electric currents in wires. Magnetic characteristics and magnetic fields are found in naturally occurring minerals. The mobility of electrons in the material's atoms produces these magnetic fields.

Spins are also caused by an electron feature known as the magnetic dipole moment, which is linked to the intrinsic spin of individual electrons. Because of the random orientation of the numerous constituent atoms, little or no field is observable outside the matter in most materials. However, in some materials, such as iron, atoms within a given distance tend to align in one direction.

3 Conclusion

Electromagnets produce magnetic fields that are employed for the devices' specific functions. Transformers, relays, motors, and other similar equipment fall under this category. The magnetic field produced in a transformer enables an emf to be generated in the secondary coil, allowing voltage transmission between two magnetically connected circuits.

In circuits, the magnetic field caused the piston to move, closing or opening contacts, while in motors, the magnetic field caused the motor to revolve in a certain direction. As a result, electromagnetism is used widely and in a variety of applications. So, let's have a look at a few of the applications of electromagnetism.

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5 Conflict of interests

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