ELECTRIC CHARGE

According to ‘MATTER (Re-examined)’

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Abstract: Most people treat electric charges almost like physical (real) entities. They are assumed to exist in association with the fundamental particles (electrons and protons), and they could be transferred from one material body to another along with these fundamental particles. Similar electric charges are believed to repel each other, and dissimilar electric charges are believed to attract each other. These widely held assumptions, in contemporary physics, have neither a rational mechanism nor a logical basis. This article briefly explains the nature, structure, and mechanism of interactions between electric charges as given in an alternative concept proposed in the book ‘MATTER (Re-examined)’. Although these explanations differ from the currently accepted beliefs, they are based on consistent reasoning initiated by a single assumption about the existence of matter.

Key words: Electric charge, electric field, zilch-effort distance.

Introduction:

The alternative concept proposed in the book ‘MATTER (Re-examined)’, is developed from a single assumption that ‘Substance is fundamental and matter alone provides substance to all real entities’. Except for the existence of matter, no other entities or phenomena are assumed. All real entities and physical phenomena (as in contemporary physics) are developed from this basic assumption. Electric charge is one of the many functional entities developed in this manner. The electric charge has no distinct real existence. It is an indicative reference of an electric field. All conclusions expressed in this article are taken from the book ‘MATTER (Re-examined)’ [1]. Kindly refer to the same for details. This concept envisages that matter in its unstructured state tends to furcate into very small bits—quanta of matter—in single spatial dimensional existence. Quanta of matter, in turn, form two-dimensional latticework structures, which may be called 2D energy fields. 2D energy fields in all possible planes in space, together, form an all-encompassing ‘universal medium’. The universal medium fills the entire space outside the most basic 3D matter particles. Structural distortions in the universal medium, in and about a 3D material body are the work associated with it, and the stress produced in the universal medium due to its structural distortions is the energy associated with the 3D material body.

In a structurally distorted region of the universal medium, the latticework structures of all 2D energy fields passing through the region are deformed, each one separately in its plane. A structurally deformed region in the universal medium is called a field. As a 2D energy field is a two-dimensional entity, its latticework structure can be deformed only in three ways. Latticework structure, deformed in linear directions, gives rise to magnetic phenomena. Latticework structure, deformed in angular directions, gives rise to electric phenomena. Latticework structure, deformed in inward radial directions, gives rise to gravitational phenomena. Latticework structure, deformed in inward or outward radial directions, gives rise to nuclear phenomena. The presence of 3D matter is the sole requirement for a gravitational field. Electric, magnetic, and nuclear fields are permanent distortion fields in the universal medium, sustained by the regular movements of the most basic 3D matter particles in 3D material objects. We use imaginary lines of force to represent distortion fields and their directions.

Electric charge:

Angularly (circularly) deformed latticework structures in the 2D energy fields within a region of universal medium form a three-dimensional electric field around a 3D material body. An electric field in each plane is separate and distinct. Electric fields are two-dimensional in their basic constitution. Angular (circular) distortions in the latticework structure in a plane cannot have different natures or be of different types. The angular displacements of latticework squares constituted by quanta of matter in a 2D energy field are all similar, in whichever direction they are moved. They may have either of the two directions about a reference point. Therefore, all electric fields are identical, except for their directions. The relative direction of an electric field, represented by its lines of force, is indicated by the term ‘electric charge’. Similarly, the direction of a magnetic field, represented by its lines of force, is indicated by the term ‘magnetic pole’.

In each plane, an electric field is represented by imaginary circular or curved lines of force, and hence it has two faces. The face where the lines of force appear in a clockwise direction is the ‘positive electric charge’ and the face where the lines of force appear in an anti-clockwise direction is the ‘negative electric charge’ of the electric field. They distinguish the directions of lines of force in an electric field with respect to an observer. They do not indicate a qualitative difference. All electric fields (in each plane) have both positive and negative electric charges. As the electric charge represents a relative direction, its sense depends on the reference used. An electric field (in a plane) may be assumed to have a positive electric charge when viewed from one side, and the same electric field will have a negative electric charge when viewed from the opposite side.

Separation of the electric charges into two (positive and negative) categories with different natures is a fallacy, presently considered to be fundamental. There are no different types of electric charges, as believed today. An electric charge is nothing but the direction of (imaginary) lines of force of an electric field. Positive and negative electric charges of an electric field are synonymous with the north and south poles of a magnetic field.

The linear distortion field (magnetic field) in each plane has its central axis in that plane. However, an angular distortion field (electric field) in each plane has its axis across the plane. This geometrical necessity compels the axes of associated electric and magnetic fields to be perpendicular to each other.

The distinction between an angular (electric) field and a linear (magnetic) field depends on the magnitude of the curvatures of their lines of force. A distortion field with a low curvature of its lines of force subscribes to greater magnetic phenomena and lesser electric phenomena. A distortion field with a higher curvature of its lines of force subscribes to lesser magnetic phenomena and greater electric phenomena. Because of this peculiarity, an electric field behaves as a magnetic field when the distance of action is farther from the centre of its source. Usually, the electric property of an electric field is exhibited only at extremely small distances.

Interaction:

Actions by an effort are accomplished by the transfer of work, and they are recognised by the displacement or change of state of motion of 3D material bodies. Due to the inherent stabilising properties of the universal medium, deformations from the region of higher distortion density are automatically transferred to the regions with lower distortion density, separately in each 2D energy field. During the transfer of deformations in the 2D energy fields, basic 3D matter particles in the region are also carried along with the distortions. Displacements of constituent 3D matter particles of a material body produce its inertial motion.

Being parts of 2D energy fields, only those distortion fields in the same plane can interact. Unidirectional distortions enhance each other, and opposing distortions lessen each other. Similar linear distortion fields increase distortion density in the region between them. Dissimilar distortion fields reduce distortion density in the region between them. Similar angular distortion fields reduce distortion density in the region between them. Dissimilar angular distortion fields increase distortion density in the region between them.

Two similar magnetic fields (with lines of force that are unidirectional) placed nearby increase distortion density in the universal medium between them. Structural distortions, while being transferred outward from the higher distortion density region, move the magnetic fields and associated 3D material bodies away from each other. This appears to be a repulsion between similar magnetic poles. Similarly, two dissimilar magnetic fields (with lines of force that are in opposite directions) placed nearby reduce distortion density in the universal medium between them. Structural distortions, while being transferred inward from the higher distortion density region, move the magnetic fields and associated 3D material bodies towards each other. This appears to be an attraction between dissimilar magnetic poles.

Due to the angular nature of electric fields, the relative directions of their lines of force are somewhat different. Two similar electric fields have lines of force between them in opposite directions. Similarly, two dissimilar electric fields have lines of force between them in the same direction. When the centers of electric fields are farther apart, the curvatures of the lines of force are small, and the interaction between them is similar to the interaction between magnetic fields. At larger distances between the centers of electric fields, the magnetic properties of the distortion fields are dominant.

Therefore, two dissimilar electric fields (lines of force between them that are unidirectional) placed nearby but farther than a definite distance (called the zilch-effort distance) increase the distortion density between them. Higher distortion density, while being transferred outwards, moves the 3D material bodies bearing dissimilar electric fields away from each other. Their displacements appear as mutual repulsion between the 3D material bodies that bear dissimilar electric fields. This action is similar to the mutual repulsion between two similar magnetic fields. Similarly, two similar electric fields (lines of force between them are in opposite directions), placed nearby but farther than a definite distance (called the zilch-effort distance), reduce the distortion density between them. Higher distortion density, while being transferred inward, moves the 3D material bodies bearing similar electric fields towards each other. Their displacements appear as a mutual attraction between the 3D material bodies that bear similar electric fields. This action is similar to the mutual attraction between two dissimilar magnetic fields. Hence, at large distances (beyond zilch-effort distance) between them, two dissimilar electric charges apparently repel each other (like similar magnetic poles), and two similar electric charges apparently attract each other (like dissimilar magnetic poles).

However, at close range, due to the higher curvatures of their lines of force, the electric properties of electric fields are dominant. The smaller extent of the universal medium between the electric fields at close range is unable to produce large inertial efforts due to the changes in the distortion density in the region. At the same time, the distortion fields at the sides are strong enough to produce the required differences in the distortion densities and cause inertial efforts on the corresponding 3D material bodies. (For a detailed mechanism, see [1]).

Therefore, two dissimilar electric fields (lines of force between them are unidirectional), placed nearby and within a definite distance (zilch-effort distance), reduce the distortion density in the region between them. Higher distortion density, while being transferred inward, moves the 3D material bodies that bear the electric fields towards each other. This appears to be an attraction between the

3D material bodies that bear dissimilar electric fields. Similarly, two similar electric fields (lines of force between them are in opposite directions), placed nearby and within a definite distance (zilch-effort distance), increase the distortion density in the region between them. Higher distortion density, while being transferred outward, moves the 3D material bodies that bear the electric fields away from each other. This appears as a repulsion between the 3D material bodies that bear similar electric fields. Hence, at very small distances between them, two dissimilar electric charges apparently attract each other (like dissimilar magnetic poles), and two similar electric charges apparently repel each other (like similar magnetic poles).

The resultant inertial actions due to the interactions between electric fields depend on their charges and the distance between their centers. At a definite distance (zilch-effort distance) between their centers, the magnitudes of inertial actions on the 3D material bodies that bear the electric fields become zero, and on either side of this distance, the directions of the inertial actions reverse. This distance, at which the magnitude of inertial action is zero, may be called the zilch-effort distance. Thus;

Dissimilar electric charges, interacting from beyond zilch-effort distances, apparently repel each other.

Similar electric charges, interacting from beyond zilch-effort distances, apparently attract each other.

Dissimilar electric charges, interacting at zilch-effort distances, produce no inertial action.

Similar electric charges, interacting at zilch-effort distances, produce no inertial action.

Dissimilar electric charges, interacting within zilch-effort distances, apparently attract each other.

Similar electric charges, interacting within zilch-effort distances, apparently repel each other.

Conclusion:

Only the primary electric fields exhibit the true nature of angular distortion fields. Other electric fields exhibit the resultants of many primary electric fields acting simultaneously in many planes. Nevertheless, what we come across in nature are electric fields. Primary electric fields are so small that we cannot notice them in practice. Actions of electric fields are the result of the simultaneous actions of many primary electric fields in different planes. All of them, acting simultaneously and together, produce three-dimensional appearances.

Reference:

[1] Nainan K. Varghese, MATTER (Re-examined), https://www.matterdoc.info

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