

# ELECTRIC CHARGE

According to 'MATTER (Re-examined)'

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*Abstract:* Electric charges are usually treated almost like physical entities. They are assumed to exist in association with electrons and protons and could be transferred from one matter-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 believed assumptions, in contemporary physics, have no logical basis. This article briefly explains nature, structure and mechanism of interaction of electric charges, as given in an alternative concept. Although they differ from currently accepted beliefs, they are based on consistent reasoning, initiated from a single assumption on existence of matter.

*Keywords:* Electric charge, electric field, zilch-effort distance.

## Introduction:

Alternative concept, described in book, 'MATTER (Re-examined)', is developed from a single assumption that '*Substance is fundamental and matter alone provides substance to all real entities*'. Except existence of matter, no other entities/phenomena are assumed. All entities and phenomena (as in contemporary physics) are developed from this basic assumption. Electric charge is one of the functional entities, developed in this manner. Electric charge has no distinct real existence. It is an indicative reference. All conclusions, expressed in this article, are taken from the book 'MATTER (Re-examined)' [1]. For details, kindly refer to the same.

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 three-dimensional space, together, form an all-encompassing universal medium. Universal medium fills the entire space, without voids, outside basic 3D matter-particles. Distortions in universal medium, surrounding a 3D matter-body, is the work associated with it and the stress produced in universal medium due to the deformation is the energy associated with the 3D matter-body.

In a distorted region of universal medium, latticework-structures of all 2D energy-fields passing through the region are deformed, separately in their own planes. As 2D energy-field is a two-dimensional entity, its latticework-structure can be deformed in three ways only. Latticework-structure, deformed in linear direction, gives rise to magnetic phenomena. Latticework-structure, deformed in angular direction gives rise to electric phenomena. Latticework-structure, deformed in radial directions gives rise to gravitational or nuclear phenomena. Electric fields, magnetic fields and nuclear fields are permanent distortion-fields in universal medium, sustained by regular movements of basic 3D matter-particles in matter-bodies. Presence of basic 3D matter particles is the sole requirement for gravitational field. We use imaginary lines of force with arrows to represent distortion-fields and their directions.

### **Electric charge:**

Angularly (circularly) distorted regions in 2D energy-fields (within a region of universal medium) form a three-dimensional electric field around a 3D matter-body. Electric field in each plane is separate and distinct. Electric fields are two-dimensional in nature. Angular (circular) distortions in latticework-structure in a plane cannot have different natures or they cannot be of different types. Angular displacements of latticework-squares (constituted by quanta of matter) are similar, whichever way they are moved. They may have either of two directions with respect to a reference point. Therefore, all electric fields have to be identical, except for their directions. Direction of electric field (or of its lines of force) is indicated by the term 'electric charge'. Similarly, direction of a magnetic field (or of its lines of force) is indicated by the term 'magnetic pole'.

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

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

Linear distortion-field (magnetic field), in each plane, has its axis in its own plane. However, angular distortion-field (electric field), in each plane, has its axis across its plane. This geometrical necessity makes axes of associated electric and magnetic fields perpendicular to each other.

Distinction between angular (electric) field and linear (magnetic) field depends on magnitude of curvature of their lines of force. Distortion-field with low curvature subscribes greater magnetic phenomenon and lesser electric phenomenon. Distortion-field with high curvature of its lines of force subscribes lesser magnetic phenomenon and greater electric phenomenon. Because of this peculiarity, an electric field behaves as a magnetic field, when distance of action is farther from its centre. Usually electric property of an electric field is exhibited only at extremely small distances.

### **Interaction:**

Actions are recognized by displacement/change of state of motion of 3D matter-bodies. Due to inherent stabilizing properties of universal medium, deformations from region of higher distortion-density are automatically transferred to regions with lower distortion-density, separately in each 2D energy-field. During transfer of deformations in 2D energy-fields, basic 3D matter-particles in the region are also carried along with them. Displacements of constituent basic 3D matter-particles produce inertial motion of a macro body.

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 linear 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 (lines of force are unidirectional), placed nearby, increase distortion-density between them. Higher distortion-density, while being transferred outwards, moves the magnetic fields and associated 3D matter-bodies away from each other. This appears as repulsion between similar magnetic poles. Similarly, two dissimilar magnetic fields (lines of force are in opposite directions), placed nearby, reduce distortion-density between them. Higher distortion-density on outer sides, while being transferred inwards, moves the magnetic fields and associated 3D matter-bodies towards each other. This appears as attraction between dissimilar magnetic poles.

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

Therefore, two dissimilar electric fields (lines of force between them are unidirectional), placed nearby but farther than certain distance, increase distortion-density between them. Higher distortion-density, while being transferred outwards, moves 3D matter-bodies that bear the electric fields away from each other. This appears as repulsion between 3D matter-bodies that bear dissimilar electric fields. Similarly, two similar electric fields (lines of force between them are in opposite directions), placed nearby but farther than certain distance, reduce distortion-density between them. Higher distortion-density on outer sides, while being transferred inwards, moves 3D matter-bodies that bear the electric fields towards each other. This appears as attraction between 3D matter-bodies that bear similar electric fields. Hence, at large distances 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 higher curvature of lines of force, electric properties of electric fields are dominant. Smaller extent of universal medium, between electric fields at close range, is unable to produce large inertial efforts due to changes in distortion-density. At the same time, distortion-fields at the sides are strong enough to produce required differences in distortion-density and cause inertial efforts on corresponding 3D matter-bodies. (For detailed mechanism, see [1]).

Therefore, two dissimilar electric fields (lines of force between them are unidirectional), placed nearby and within certain distance, reduce distortion-density on their sides. Higher distortion-density, while being transferred inwards, moves 3D matter-bodies that bear the electric fields towards each other. This appears as attraction between 3D matter-bodies that bear dissimilar electric fields. Similarly, two similar electric fields (lines of force between them are in opposite directions), placed nearby and within certain distance, increase distortion-density on their sides. Higher distortion-density on sides, while being transferred outwards, moves 3D matter-bodies that bear the electric fields away from each other. This appears as repulsion between 3D matter-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).

Resultant inertial actions due to interactions between electric fields depend on their charges and distance between their centers. At certain distance between their centers, magnitudes of inertial actions become zero and on either side of this point, directions of inertial action reverse. This distance, at which magnitude of inertial action is zero, may be called zilch-effort distance. Thus;

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*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.*

Only primary electric fields exhibit true nature of angular distortion-fields. Other electric fields exhibit 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 resultant of simultaneous actions of many primary electric fields in different planes. All of them, acting together and simultaneously, together, produce three-dimensional appearance.

### **Reference:**

- [1] Nainan K. Varghese, *MATTER (Re-examined)*, <http://www.matterdoc.info>

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