FIELDS

According to 'MATTER (Re-examined)'

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Abstract: 'Action at a distance through empty space' is an utterly illogical assumption, used in contemporary physics. To mitigate the irrationality of this assumption, various fields are employed in the explanations of different theories. Generally, these fields are undefined and quite vague in their structures, forms, and actions. This essay attempts to briefly describe a real entity, composed of matter in definite structural formations and with a logical mechanism of action, which can substitute for various types of undefined fields.

Keywords: Fields, inertial field, gravitational field, dynamic distortion-field, static distortion-field, magnetic field, electric field, nuclear field, magnetic potential, electric potential, electrostatic field.

Introduction:

'Action at a distance through empty space' is the most illogical assumption used in contemporary physics. To overcome the assumption that physical influences can be transmitted through empty space, without any material or physical agency, fields are used to describe actions in all cases where two objects, separated in space, influence each other. Fields are assumed to condition the space such that when an object is placed in it, the object experiences an effort. Effort, experienced due to a given field, exists only if the object itself is also a source of the same kind of field. In the description of a field, it is assumed that when the source-object creates a field (in every direction around it), the receiver-object experiences the same field, existing at its location. Effects of the changes at the source-object propagate outward through the field and are felt by the receiver-object after a certain delay. Thus, the field is an intermediary for transmitting efforts (forces). Each type of effort (electric, magnetic, nuclear, or gravitational) has its own appropriate field.

In contemporary physics, a field is a region in which every point is affected by an effort. Since each point in a field has a value (in space and time), it is considered a tangible entity. A field is also considered to occupy space, to possess momentum, to contain energy, and to eliminate the true vacuum. It appears as a real entity and works like an extension of an object. Yet, it has neither substance, nor structure, nor logical mechanism of action, which are essential attributes of real entities. Generally, fields are undefined and quite vague in their concepts.

An alternative concept, proposed in the book 'MATTER (Re-examined)', considers the field as a deformed region in a universal medium. Depending on the nature of structural distortions, distortion-fields about 3D material bodies may interact to influence each other, which in turn affects corresponding 3D material bodies. As part of the universal medium (that fills the entire space outside basic 3D matter-particles), the distortion-field is a real entity made of matter, with definite structure and mechanism of actions. Its constituents, mechanism of formation, stability, structure, and mechanism of action are detailed in the book. A very brief description of its nature and classification into various 'fields' (as used in contemporary physics) is given in this essay. All conclusions expressed in this article are taken from the book 'MATTER (Re-examined)' [1]. For details, kindly refer to the same.

Universal medium:

Due to its inherent tendency to maintain its integrity, a block of structureless matter fragments into extremely small bits called 'quanta of matter', which exhibit self-elongating properties. Matter-content of a quantum of matter reduces its spatial dimensions to a minimum, until it becomes a single-dimensional entity. As the matter-content provides its objective reality, a quantum of matter has positive existence in all three spatial dimensions at all times, however small the measurements may be. Because of the structureless nature of their matter-contents, quanta of matter in different spatial systems are able to co-exist at points of their intersections.

The property of self-elongation helps quanta of matter to form junctions, where their ends meet. Junctions, of four quanta of matter each, are the most stable configurations. Numerous quanta of matter, meeting at junctions in a plane, together form a two-dimensional latticework structure of 2D energy-field that extends to infinity in all directions in its plane. Every plane in the 3D spatial system has a 2D energy-field. All actions in a 2D energy-field are limited to its plane. Actions in one plane cannot affect actions in another plane or be transferred to another plane directly. 2D energy-fields, crossing each other, co-exist at points of intersection. They are self-stabilizing entities, held in a compressed state. 2D energy-fields in all possible planes in the 3D spatial system, together, form an all-encompassing universal medium that pervades entire space, outside basic 3D matter-particles and without voids. Universal medium substitutes for the functional entity, space. It is generally homogeneous and steady, so that it can provide an absolute reference.

A combination of 2D energy-fields makes the universal medium homogeneous with uniform matter-density equal to that of a basic 3D matter-particle. All actions in nature, including the creation of 3D matter, are carried out by the universal medium. Latticework structures of 2D energy-fields provide the universal medium with the possibility of anisotropy, required for deformations during actions. Deformed regions in latticework structures of 2D energy-fields (universal medium) are distortion-fields. Structural distortions are formed by relative deflections (displacements) of quanta of matter in the latticework structures, and they are the work done on/about a material entity. Distortion-fields in all planes passing through the volumetric space about a macro body, together, form its matter-field. Matter-field of a macro body, in and around its perimeter, contains all structural distortions (work) required for the formation and sustenance of its constituent 3D matter-particles and the macro body itself, and additional structural distortions required for its whole-body motions.

Structural distortions in 2D energy-fields in all planes, passing through the volumetric space of a macrobody, together form appropriate fields about it. As the distortion-fields are constituted by additional structural distortions, they represent work done and store the associated energy. We shall consider structural distortions in the latticework structure of a single 2D energy-field to describe various kinds of fields. Distortion-fields in all planes about a macrobody form appropriate fields about it in the 3D spatial system.

Gravitational field:

A 2D energy-field is a self-stabilizing lattice structure held under compression. A gap in the latticework structure breaks its continuity. Latticework structure from all around the gap attempts to close-in and fill the gap. While doing so, it presses onto any object (which is not part of the latticework structure) present in the gap. This tendency of the 2D energy-field to compress any object is the gravitation. The magnitude of gravitation in any direction is proportional to the extent of the 2D energy-field in the direction from where it is applied. Due to the inward compression of the latticework structure, distortion-density nearer to an object is greater, and the distortion-density reduces as the distance from the object increases. The structurally distorted region in the 2D energy-field in and around an object is the gravitational field of that object. The gravitational field is of a static nature and maintains its magnitude as long as the object exists with constant parameters.

The extent of the 2D energy-field from an object (in free space) is infinite in all directions in its plane. If there is more than one object in a plane, the extent of the 2D energy-field between them is equal to the distance between them, which is less than the extent of the 2D energy-field on their outer sides. Therefore, the magnitudes of gravitation on the outer sides of objects are greater than the magnitude of gravitation on the objects from the 2D energy-field between them. As a result, both objects experience resultant efforts to move them towards each other. This dynamic part of gravitation is the gravitational attraction (gravity). [Only this minor part of gravitation is considered in contemporary physics as gravitation]. Depending on the parameters of objects, the magnitude of gravitational attraction between them varies.

Displacements of 3D material bodies (under gravitational attraction) through the universal medium produce additional structural distortions in the latticework structures of 2D energy-fields within their matter-fields. This action may be considered as a conversion of gravitational action into inertial action. [Adjective inertial indicates actions related to inertia]. All actions are understood by their inertial effects on 3D material bodies.

Inertial field:

The continuity of the latticework structure of the 2D energy-field is always maintained unless it breaks down locally. Structural distortions in a continuous latticework structure cannot remain in one place. Structural distortions have a natural tendency to spread (transfer) from a region of higher distortion-density to a region of lower distortion-density along straight-line paths. Once certain structural distortions have commenced their transfer, they do not stop unless neutralized or modified by additional structural distortions introduced into the same plane with the help of an external source. These two characters combine to provide the property of inertia to the universal medium. Due to the inertia of additional structural distortions in the universal medium, a macrobody maintains its state of motion in a straight-line path, unless additional structural distortions are modified (the macrobody is affected by external efforts).

Structural distortions (work) in the matter-field of a macrobody, required for (a) the creation and sustenance of its constituent basic 3D matter-particles, (b) development and sustenance of constituent superior 3D matter-particles, (c) Development of the macrobody and sustenance of its integrity are stored in its matter-field as intrinsic work associated with the macrobody. Macrobody's state of motion is determined by additional structural distortions introduced into its matter-field from external sources. These additional structural distortions continue to move the macrobody at constant linear speed and in a straight-line path. This part of the additional structural distortions (work) forms the macro body's inertial field. Inertial fields carry the associated macrobody through the universal medium at any (proportional) constant linear speed, limited by the linear speed of light.

For a macrobody, inertial fields for its rotary motion and linear motion are distinctly separate, and they maintain their independence at all times, even while the macrobody appears to have a resultant motion. As long as the magnitudes of additional structural distortions in the matter-field are not modified, the magnitudes and directions of inertial-fields remain constant. Hence, they may be considered static in nature. A distortion-field varying cyclically in magnitude and not associated with a macrobody, when transmitted through the universal medium, is an electromagnetic field.

Dynamic distortion-field:

Photons are corpuscles of radiation (light, etc.). Each photon is constituted by a disc-shaped 3D matter-core surrounded by a structurally distorted region (inertial-pocket) in the universal medium. To maintain the stability of the photon and the universal medium, it is essential for the universal medium to move the photons at the highest possible linear speed in a straight-line path, while spinning their 3D matter-cores at a speed proportional to their 3D matter-contents. In a stable condition of a photon, there is no interaction between the photon's inertial-pocket and the external universal medium. The instability of the straight-line path of a photon compels the universal medium to initiate a stabilizing process by introducing additional structural distortions in the inertial-pocket. A number

of unstable photons moving through the same path in rapid succession sustain additional structural distortions in a region, introduced by the universal medium in its latticework structures, to act as a separate distortion-field. This is the fundamental method by which the distortion-fields are produced.

In order to sustain a distortion-field about a 3D material body, movements of unstable photons in the same direction along the same path, in rapid succession, are essential. This is achieved by having pairs of photons moving about each other in a common circular path, in primary 3D matter-particles. Due to their circular paths, resultant structural distortions around their unions form circular (curved) distortion-fields. To sustain a circular distortion-field, a flow of photons through the same path is essential. Circular distortion-field ceases when the paths of photons become stable along a straight line. As a continuous flow of photons is essential, these distortion-fields may be classified as dynamic distortion-fields. Basic circular (dynamic) distortion-fields, under different arrangements, form all other types of dynamic distortion-fields, with structural distortions of diverse natures. The average direction of structural distortions in a distortion-field about a macrobody is the resultant of the relative directions of linear movements of unstable photons in it. Imaginary lines of force are used to indicate the direction of a distortion-field.

There are only three methods by which the latticework structure of a 2D energy-field can be deformed. Latticework structure can be deformed so that a distortion-field appears in any direction with linear structural distortions, with curved/circular structural distortions, or with radial structural distortions. Accordingly, depending on the nature of structural distortions, dynamic distortion-fields may be classified into magnetic, electric, or nuclear fields.

Magnetic field:

Latticework-structure of a 2D energy-field, deformed in a linear direction, forms a magnetic field. Magnetic field is a dynamic distortion-field, formed by arranging a number of circular distortion-fields about an axis. Similar arrangements in all 2D energy-fields about an axis in the 3D spatial system form a magnet. The direction, from where the lines of force of the magnetic field appear to begin is assigned magnetic north polarity. The direction, towards where the lines of force of the magnetic field appear to terminate, is assigned magnetic south polarity. Magnetic poles of a magnetic field are relative references, similar to electric charges. Hence, they depend on the chosen reference. Similar magnetic fields augment each other, and dissimilar magnetic fields diminish each other.

Electric field:

Latticework-structure of 2D energy-field, deformed in circular/curved direction, forms an electric field. An electric field is a dynamic distortion-field, formed by structural distortions around circular paths of unstable photons in primary 3D matter-particles or by the resultant of many primary electric fields about a point in space. Similar arrangements of electric fields in all 2D energy-fields, perpendicular to the axis of a conductor along its length, form an electric current. The direction, from where the lines of force of the electric field appear clockwise, is assigned as positive electric charge. The direction, from where the lines of force of the electric field appear anti-clockwise, is assigned as negative electric charge. (Electric charge is not a special entity). Electric charges of an electric field are relative references, similar to magnetic poles. Hence, they depend on the chosen reference. Every electric field has both positive and negative electric charges. Similar electric fields augment each other, and dissimilar electric fields diminish each other.

Nuclear field:

Latticework structure of 2D energy-field, deformed in radial direction, forms a nuclear field. If lines of force are directed outward from a central point, it is a repulsive nuclear field. If lines of force are directed inward towards a central point, it is an attractive nuclear field. Nuclear fields are produced only about the positrons and electrons. The nuclear field about a positron is attractive, and the nuclear field about an electron is repulsive in nature. Since the structural distortions are radial, nuclear fields cannot augment each other to produce a larger nuclear field than that which can be produced either by a positron or an electron.

Static distortion-field:

As and when a dynamic distortion-field is deflected from its stable position with respect to neighboring dynamic distortion-fields, universal medium tends to restore its stable position. For this, the latticework structures in the universal medium are additionally deformed. This part of the additional structural distortions gives rise to a static distortion-field. It continues to exist as long as the relative deflections of dynamic distortion-fields exist. Neighbouring atoms in a macrobody usually acquire relative positions, so that the macrobody, as a whole, is electrically and magnetically neutral towards other neutral macrobodies. However, these arrangements can be offset by various methods. Deflection of the atomic axes of neighboring atoms/molecules from their relatively stable alignments causes additional deformation in the universal medium.

Magnetic potential field:

If additional structural distortions, due to the re-arrangement of atoms/molecules in a macrobody, exhibit a resultant magnetic field about it, it becomes a magnet and is considered to have certain magnetic potential (field). A magnetic potential field between neighbouring atoms is essential in a conductor to produce an electric current through it.

Electric potential field:

If additional structural distortions due to deflections of neighbouring atoms in a macro body exhibit a resultant electric field about them, the macro body becomes electrically charged (ion). Deflection of the atomic axis of an atom from its stable alignment with respect to the atomic axes of neighbouring atoms is its electric potential. The average of the magnitudes of the electric potential of all atoms in a conductor is the electric potential of the conductor. Additional structural distortions in the universal medium due to atoms' deflections are the electric potential (field). The difference in magnitudes of electric potential (fields) between neighbouring atoms in a conductor is essential to produce an electric current through it. As a single atom does not have neighbouring atoms, it cannot be ionised (electrically charged).

Electrostatic field:

Two electric potential fields (across a region in the universal medium) strain the latticework structures of 2D energy-fields between them. Additional structural distortions introduced by the strain form an electrostatic field. The electrostatic field between two electric potential fields tends to support the stability of the electric potential fields.

Conclusion:

The universal medium is a materialistic entity that fills the entire space, outside the basic 3D matter-particles. Deformed regions in the universal medium, about macrobodies, are real entities, called distortion-fields. They can replace undefined 'fields' (of different types), used currently in various theories.

Reference:

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

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