

PLANETARY MAGNETISM

(According to “Hypothesis on MATTER”)

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Abstract: Cause and nature of planetary magnetism is described on the basis of a radically different concept, put forward in the “Hypothesis on MATTER”. Planetary magnetic field is produced by directional alignment of free atoms/molecules in relatively calm fluids on or near the surface of a spinning planet. Alignment of free atoms and hence the strength of magnetism depends on the spin speed and the quantity of fluid matter in a macro body. Magnets formed about either hemisphere (about its equator) of a planet are independent of each other. Natural upheavals or gradual re-distribution of ocean water on earth affect the strength and direction of terrestrial magnetism.

Keywords: Secondary electric field, Planetary magnetism, Terrestrial magnetism, Solar system, Celestial mechanism, Cosmology, Hypothesis on MATTER.

Introduction:

“Hypothesis on MATTER” describes an alternative concept. In it: the matter content of a body and the energy about a body are distinctly separate. Matter content is the total sum of three dimensional matter particles in a body. Energy is the strain developed due to ‘distortions’ in the natural latticework arrangements of basic matter particles in and about a body. Matter content and energy content of a body cause and support each other for their existence and stability. They are not convertible into each other. Entire space is filled with ‘2D energy fields’, two dimensional latticework formations by basic 1D quanta of matter. 2D energy fields, in various directions and planes, passing through a point, co-exist. Although, 2D energy fields are made of rigid matter particles, it has all properties of an ideal liquid. All actions on and by the matter particles are caused and performed by and through the medium of 2D energy fields. This avoids the assumption of ‘actions at a distance’, while considering actions of forces.

Distorted region of 2D energy fields in space is a distortion field. Distortions in 2D energy field fields strain them. Strain in a 2D energy field due to the stored distortion is the energy stored in that region. Distortion fields may be classified according to the type of distortions, they contain. There are three possible types of distortions in the 2D energy fields. Distortions in linear directions produce magnetic field,

distortions in angular directions produce electrical field and distortions in radial directions about a central point produce nuclear field.

Creation and sustenance of 3D matter particles are the major gravitational actions. 2D energy fields do suffer local breakdown due to various reasons. Quanta of matter released from the 2D energy fields, during their breakdowns, are gathered together by the surrounding 2D energy fields to form 2D disturbances. Larger disturbances are compressed further to form photons, the basic 3D matter particles. Under gravitational actions, two high matter-content photons form a union to create a primary particle – the biton. Bitons in various combinations create the fundamental particles – positrons, electrons, neutrons, protons and deuterons. Deuterons are major components of nuclei of atoms. Deuterons in the nuclei of larger atoms arrange themselves in tubular structures. Orbiting Electrons of an atom form another tubular structure around the nucleus. Thus, all (larger) atoms are tubular in structure. Linear motion at high speed, through the 2D energy fields, tends to align any free atoms so that the axis of their tubular structures are in the direction of their linear motion.

Most types of atoms have resultant distortion fields about their bodies, which may be neutralized during formation of molecules. Due to their spin motion, the atoms have additional angular distortion field (electric field) in the 2D energy fields about them, in the direction of their spin. This is the secondary electric field of an atom. Although the secondary electric field, about an atom, is too small to be noticed, when great many atoms, spinning in the same direction are accumulated in a region, their secondary electric fields may give rise to reasonably strong electric field.

All conclusions expressed in this article are taken from the “*Hypothesis on MATTER*” [1]. For details, kindly refer to the same.

Planetary Magnetism:

Earth and other similar massive bodies in space are huge collection of atoms of various elements and molecules of compounds. Inter-particle (apparent) attraction due to gravitation during the formation of these massive bodies, make them spherical, in shape. Motion of matter particles, during the formation of a large body, causes its spin motion. Those bodies, which form multi-body systems, develop spin motions during their orbital motion about each other. Some of the atoms/molecules in these bodies are held rigidly in solid matter, some others are held loosely in liquid matter and yet some others are more freely floating as in gases. Most of these atoms/molecules have secondary electric fields. Due to definite orientation of these atoms with respect to each other, in small groups in a macro body, a macro body as a whole appears to be electrically neutral

Nuclei of most atoms (and the atoms themselves) are tubular in shape. Every atom on or near the macro body of a spinning planet is carried along with it, in its rotation. All matter particles in the spinning planet moves within and relative to planet’s matter field. Hence all actions of these particles are with respect to the planet’s matter field rather than with the 2D energy fields outside planet’s matter field. Matter is inert. It is the transfer of distortions in the 2D energy fields about a matter body that is carrying the matter particles, to move them. Distortions in 2D energy fields tend to choose the easiest path for their transfer. Due to the fluid nature of the 2D energy fields and the tubular shape of atoms, all loosely held atoms on a rotating macro body tend to line up in a direction parallel to the direction of their motion along with planet’s surface. This is a simple mechanical arrangement, required for the easiest path for the transfer of distortions in the 2D energy fields. Selection of easiest path of transfer of distortions may be understood as a path for relative motion with least apparent resistance. All free atoms on or near the equatorial region (due to lower speed of the regions of higher latitudes, they may be disregarded) of the spinning planet tend to line up with their axes in east-west direction.

Secondary electric fields of these atoms have their similar electric charges facing east or west. [Electric charge of an electric field is the relative direction of its imaginary lines of forces]. Each of these free atoms has its secondary electric field aligned, such that its clockwise lines of forces are facing east or west. Resultant of the secondary electric fields of all these atoms forms an electric current in the direction along the equator, forming a loop around the globe. [An electric current is nothing but the extension of electric field along a conductor – there are no displacements of fundamental particles along a current carrying conductor]. Arrangement of secondary electric fields, around the planet along the lines parallel to the

equator, produces a resultant electric current. This loop of electric current produces a magnetic field in north-south direction. In fact, this magnetic field is the resultant electric field itself, acting beyond its zilch force distance (zilch force distance is the distance between two electric fields, at which their interaction does not produce resultant inertial action on the matter bodies, which produce the electric fields) and hence acts like magnetic field. Electric fields in each plane being circular, appearance of the current loop may be likened to number of circular discs linked face to face all around equator and lines parallel to the equator, as (two secondary electric fields placed diametrically opposite about the equator) shown in figure 1. Resultant of the secondary electric fields produce resultant distortion field as shown by the dotted curved lines in figure 1. A small part of the circular line of force acts as a linear line of force. Number of lines of forces through the planet's macro body in one direction and equal number of lines of forces outside planet's macro body in the opposite direction produce a magnet through the planet as shown by the arrows, N and S. This is the planetary magnetic field.

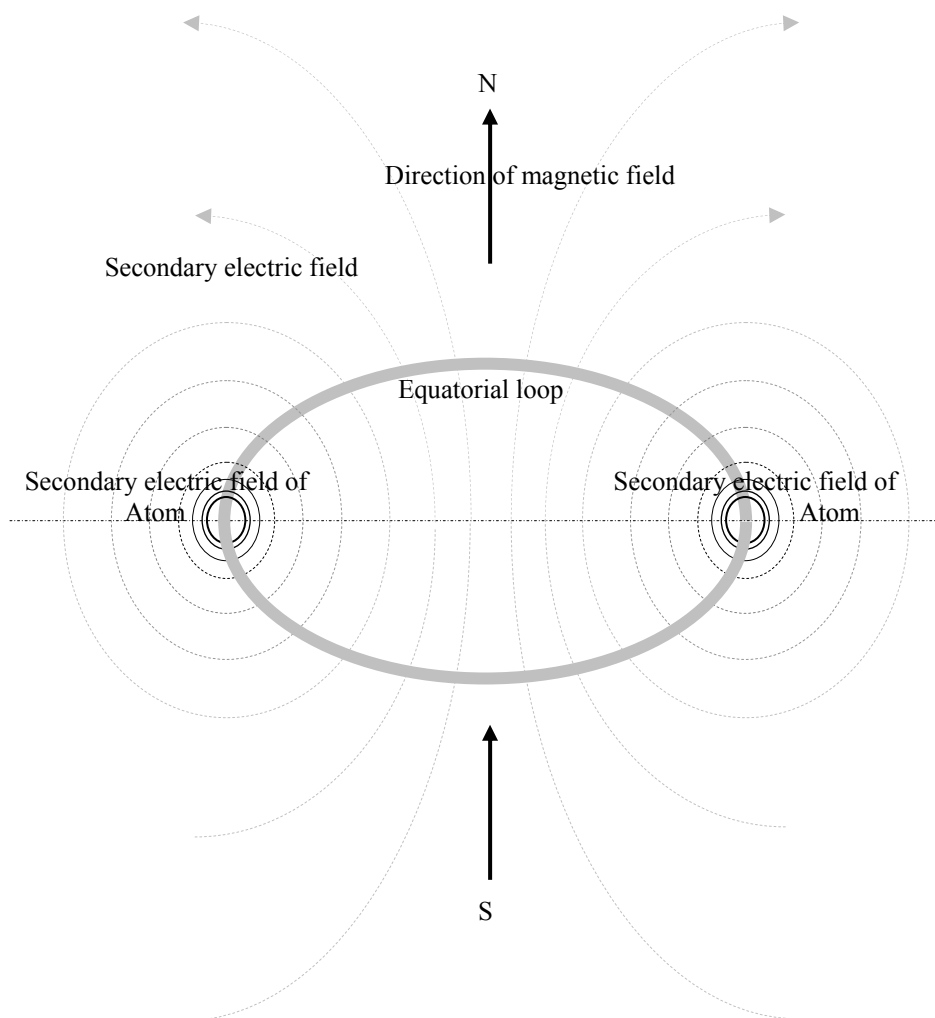


Figure 1

Terrestrial magnetic field is produced by the east-west alignment of free atoms on the surface of the earth. Alignment of these atoms is purely a mechanical action and there is nothing to prevent them from orienting their electric charges (electric charge indicate the direction of line of force in the electric field) in any of the two directions – same electric charge facing east or west. This is what happens and the secondary electric fields of most of the re-oriented atoms, being in opposite directions, neutralize each other. Secondary electric fields are not strong enough to prevent the re-orientation of the atoms against the inter-atomic binding forces. Only those secondary electric fields, which are not neutralized, contribute towards the creation of terrestrial magnetism. Hence terrestrial magnetic field is very weak and varies, depending on many factors affecting the alignment and the orientation of these free atoms.

Interior of earth is in liquid state. Magma below the earth's crust is dense. It being nearer to the spin axis of the earth, its spin speed is relatively less. We may, for the present, disregard the contribution of free atoms in the magma towards terrestrial magnetism. Atmospheric gases are unsteady and are mostly in agitated state. Hence, their free atoms cannot contribute much towards the development of the terrestrial magnetism. Liquids on the surface of earth (ocean waters) are relatively calm and carry atoms of most elements in free form. Agitation of sea water is mainly limited to surface. Hence, the free atoms in the seawater tend to remain aligned in east-west direction. So, it is the seawater in the equatorial region of earth that (mainly) helps to form earth's magnetism. Earth's solid matter, contrary to present belief, cannot contribute towards earth's magnetic field. Conversely, they are affected by earth's magnetism. Magnetic field, produced in any region (on the surface) of earth, is roughly proportional to the quantity and tangential speed of seawater in that region.

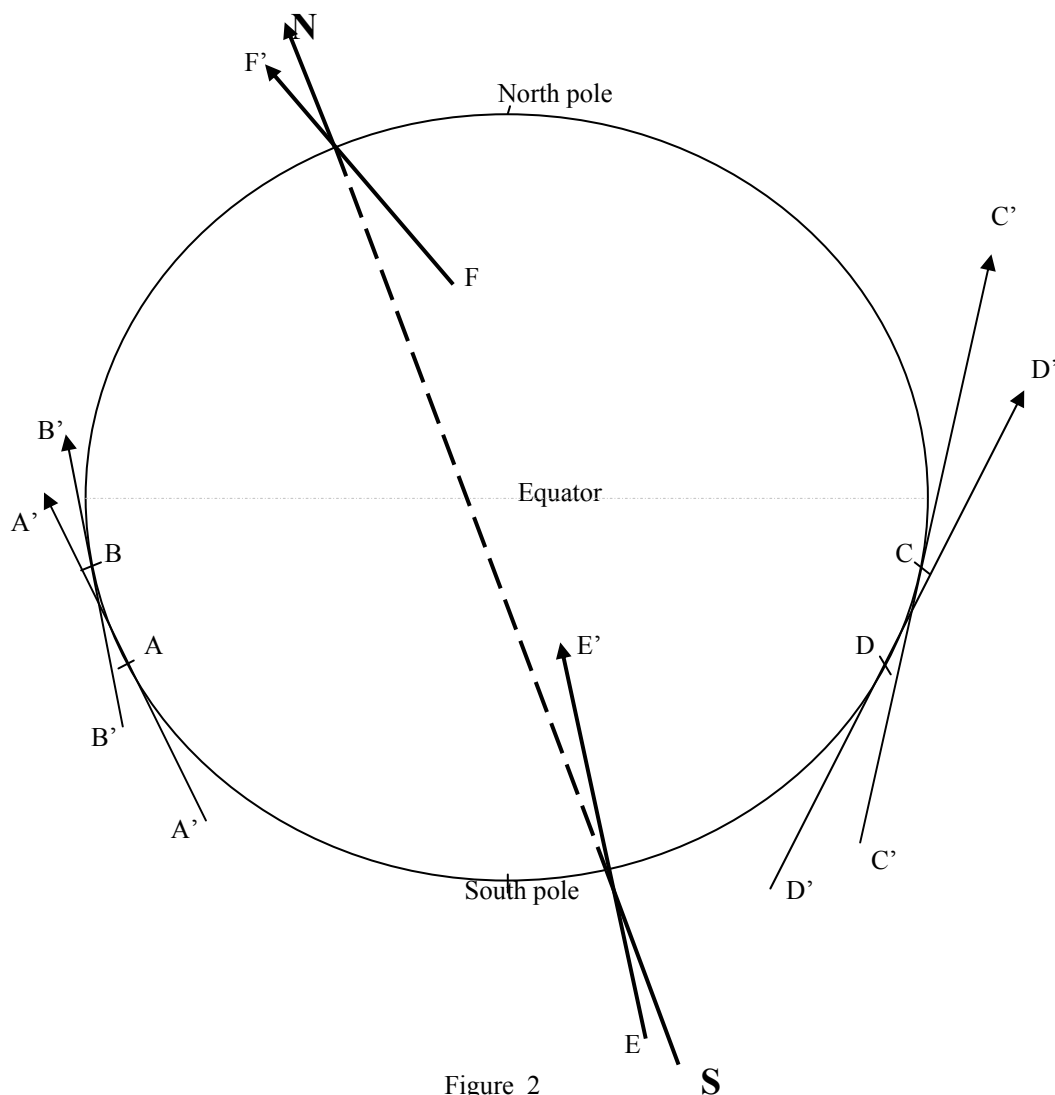


Figure 2

Earth has two hemispheres on either side of its equator as shown in figure 2. We shall take the southern hemisphere for discussion. Let B and C be two points on earth's surface on the same latitude. Similarly let A and D be two other points on the surface of earth at higher latitude. For the time being, let us suppose that the seawater is calm and identical throughout this region. Free atoms in the seawater produce magnetic fields, whose strength is proportional to the quantity of seawater at these points. Let the strengths of these magnetic fields and their directions be represented by $A'AA'$, $B'BB'$, $C'CC'$ and $D'DD'$. Direction of the magnetic field produced at a point is tangential to the surface of earth at that point. Similar magnetic fields are produced at every point on the surface of earth wherever large body of water is present. Resultant of all these magnetic fields, produced in the southern hemisphere is EE' . Similarly seawater on the northern hemisphere of earth also produce its own resultant magnetic field FF' shown in

the figure. Difference in their direction from earth's spin axis is due to the difference in the quantity of seawater at different points on the surface of earth. At each point on the surface of earth, magnetic field produced, is tangential to the surface of earth. All magnetic fields produced at certain latitude around the surface of earth form the surface of a conical section in space. Their resultant may be found by adding them, taking in to consideration both their magnitude and direction. Resultant magnetic fields produced by both hemispheres of the earth are separate. They are concentrated only at the outer pole of the magnet (in space, away from the planet). At the inner pole of the magnet (which is towards the equator), lines of forces spread out, around planet's equator. Separation of the hemispheric magnetic fields is due to the curvature of earth's surface at the equator. Cones of magnetic fields, produced at particular latitudes, are distinct and separate, each having its apex at different points in the space.

Spin speed of a planet greatly influence the east-west alignment of free atoms. Hence, planets with greater spin speed have greater chances to have stronger magnetic fields. Bodies with no spin motion or are spinning at very low speed do not have self-induced magnetism. However they may exhibit magnetic property, induced by surrounding magnetic fields extending from other bodies. Main parameters to determine the magnitude of magnetism in any direction are the number of free floating atoms in the ocean waters and their relative directions. This information is very difficult to obtain. Further, the magnetic strength in a hemisphere cannot be measured in isolation. Hence it is almost impossible to determine the magnitude of planetary magnetism from fundamental parameters. Rough relative strength and direction may be determined from the known distribution of relatively calm fluid on planet's surface. Bodies of very large planets and stars are wholly fluid and they has very dense atmosphere, which may also contribute towards their magnetism. This makes them to have much stronger magnetism.

Axis of magnetic field EE' in figure 2, which is the resultant of all magnetic fields of southern hemisphere has one of its pole near (in the direction of) earth's south geographical pole and the other pole some where inside and near the center of earth. Similarly the magnetic axis of northern hemisphere has one of its poles near (in the direction of) earth's northern geographical pole and the other pole somewhere near the center of earth. These apparent magnetic fields together produce earth's magnetic field whose axis is along the dotted line NS shown in the figure. Line NS represents earth's magnetic axis. Since the magnetic field of each hemisphere is separate and independent, earth can be considered to have two separate magnets placed somewhat end-to-end. Their strength, direction and polarity are independent of each other. It is possible to change any of this, independent of the other. Natural upheavals in ocean waters or gradual changes in the distribution of ocean water are likely to affect strength and direction of terrestrial magnetism. Any change in terrestrial magnetism due to variations in the structure of solid crust is likely to be of temporary nature.

Conclusion:

Planetary magnetism of a spinning planet is the result of free floating atoms/molecules in relatively calm fluid on or about its surface. Magnitude of resultant magnetism depends on the spin speed of the macro body and quantity of calm fluid on its surface. Similar magnetic fields are present on all large spinning bodies, which have a relatively calm fluid on it. Since all very large bodies are fluid throughout, they are likely to exhibit greater magnetism.

References:

- [1] Nainan K. Varghese, *Hypothesis on MATTER* (second edition), (2008).
<http://www.booksurge.com/Hypothesis-on-MATTER-Second-Edition/A/1419689789.htm>
- [2] Nainan. K. Varghese, ARTICLES, <http://matterdoc.hdfree.in>

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