

PLANETARY MAGNETISM

According to 'MATTER Re-examined'

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Abstract: It is generally believed that planetary magnetism is the result of motion of molten iron alloys in planetary body's core region. An assumed dynamo mechanism, in core region of a planetary body, generates magnetic field by feedback loop: electric current loops in the region creates magnetic field and changing magnetic loops in turn creates electric fields. This assumption uses circular logic. As linear speed of a spinning planetary body is much greater than (tangential) linear motion of its constituent matter particles due to planetary body's spin speed, every matter particle in spinning planetary body always moves in same direction in space. Spin motion of a planetary body is an illusion and it is valid only for considerations with respect to static reference of planetary body's spin axis. As real motion of all matter particles of a spinning planetary body (with respect to absolute reference) is always in same linear direction, swirling motion of a planetary body's interior is a myth. To consider this imaginary swirling motion of planetary body's magma, as the cause of planetary magnetism is not tenable. Even for dynamo effect to occur, a primary source of magnetism is required, which is absent in this case. Cause and nature of planetary magnetism, described in this article, is based on a radically different concept, presented in 'MATTER (Re-examined)'. For details, kindly refer to same [1].

Keywords: Secondary electric field, planetary magnetism, terrestrial magnetism.

Introduction:

Quanta of (unstructured) matter constitute observed 3D matter-bodies and universal medium, which fills entire space. Universal medium creates and sustains 3D matter-particles. Universal medium has all properties of an ideal fluid. All apparent interactions between 3D matter-bodies take place through universal medium, which is in direct contact with every 3D matter-particle in nature. This avoids assumption of 'actions at a distance through empty space'. A deformed region of universal medium is a 'distortion-field'. Distortion-fields are classified according to type of deformations. Depending on nature of distortions in universal medium, distortion-fields are classified into linear (magnetic field), angular (electric field) and radial (nuclear field) distortion-fields.

A free body is that macro body, which is free from all external influences other than efforts/actions considered. All movements are considered with respect to absolute reference (a static point in universal medium). Figures, in this article, are drawn not to scale. They are intended to depict actions described. Adjective 'inertial' means an action related to motion of 3D matter-bodies.

Atoms:

Deuterons (currently counted as one proton plus one neutron), in circular sections, link together to form tubular structures of nuclei of (larger) atoms. Electrons, attracted and approaching positrons in nucleus of an atom, cause and maintain spin motion of nucleus about its longitudinal axis. Orbital electrons of an atom form another tubular structure around nucleus. Thus, all (larger) atoms are tubular structures made of circular sections of different girth. Development of nucleus of an atom depends on availability of constituent fundamental matter-particles and continues until distortion fields, about nucleus, achieve neutral status. In certain cases, left-over distortion fields in fully-formed individual atoms are neutralised by formation of molecules, with similar or different type of atoms.

Although stable nucleus, of an independent atom, is electrically neutral within itself, its spin motion creates an external resultant electric field about it. Linear motion of free atoms at high speed, through universal medium, tends to align them, so that axes of their tubular structures are in the direction of their linear motion. This alignment provides least resistance to their motion through universal medium. In all cases, where free atoms have to move at very high linear speeds, they orient themselves in this fashion.

Secondary electric field:

In an atom, nucleus spins about its axis and orbital electrons revolve around nucleus about same axis. Each of the axially placed positrons in nucleus and electrons in orbits around nucleus not only has its electric field in planes perpendicular to nuclear axis but it is also taken around the axis, once every spin of nucleus. Hence, all electric fields, which are in the direction of spin of nucleus, gain additional angular displacement of one turn and all those electric fields, which are in opposite direction to spin of nucleus, lose angular displacement of one turn during every spin of nucleus. Changes in magnitude of angular motion of an electric field are increment or reduction in magnitude of distortion-density (in the direction of its lines of forces).

Such turning motions of the electric fields mean that concerned electric field (resultant electric field of atom, as a whole) is either strengthened or weakened. Therefore, in a spinning (electrically neutral) atom, there is a difference between its resultant electric fields in either direction. This difference gives rise to a resultant electric field about the atom, over and above any resultant electric field it has, due to arrangements of its constituents. This additional resultant electric field, developed in an atom due to its spin motion, is 'secondary electric field'. Thus, any atom with axially arranged deuterons in its nucleus and corresponding electrons in orbit (which is otherwise electrically neutral) has a secondary electric field about it, in the direction of its spin.

Most types of atoms have secondary electric fields about them. Secondary electric fields help formation of molecules, during which they may be neutralized. However, certain types of stable atoms are capable to maintain their individuality and remain independent. These atoms exhibit secondary electric fields about them. Although secondary electric field, about an atom, is too small to be noticed, when great many atoms, spinning in same direction are accumulated in a region, their secondary electric fields may give rise to reasonably strong resultant electric field.

Magnetic field about a moving macro body:

Let us consider a free fluid macro body, moving in a straight-line path at reasonably high speed. All fluid macro bodies in free space acquire spherical shape. Generally, a large composite fluid macro body is likely to contain many types of independent stable atoms, floating in it. These atoms, being tubular in shape, are likely to orient their spin axes in the direction of motion of macro body. By orienting themselves in this fashion, they experience least resistance, from universal medium, to their motion. In

fact, it is the universal medium, that is moving all atoms in macro body and universal medium chooses most efficient method to move them.

Orientation of free atoms is a mechanical action and their identical electric charges, due to secondary electric fields, may face forward or rearward direction, at random. Secondary electric fields of equal strengths in opposite directions inactivate each other. Excess secondary electric fields of free atoms in the macro body, which are not inactivated, together, form a resultant electric field about the moving fluid macro body. Depending on its composition, very large fluid macro body is likely to have one or more resultant electric fields about it in planes perpendicular to its direction of motion.

Figure 1 shows view of a large fluid macro body (looking at from its rear), moving at a considerable linear speed. Circle in thick black line represent a plane in fluid macro body, perpendicular to its line of motion. Let us consider a hypothetical condition, where all free floating atoms in macro body orient themselves in phase with each other, as shown by small circles. Secondary electric fields of atoms are shown by circular arrows in figure.

Since all secondary electric fields are in phase with each other, together, they produce resultant electric fields in all planes, perpendicular to direction of macro body's linear motion. Lines of force of resultant distortion-field exist around macro body, in all planes perpendicular to direction of its motion. It is an angular distortion-field with lines of force of very low curvature. Due to low curvature of lines of force, magnetic nature of distortion-field is prominent. As fluid macro body is sufficiently large, resultant distortion-fields around it appear as magnetic field, whose lines of force proceed around macro body, without definite magnetic poles.

In a composite macro body, atoms of different and similar types form molecules or clusters, so that each group becomes electrically as well as magnetically neutral to external neutral macro bodies, in (normal) stable state. There are comparatively very few free floating atoms in a fluid macro body.

Figure 2 shows a large fluid macro body (looking at from its rear), moving at a considerable linear speed. Circle in thick black line represent a very large fluid macro body. A, B, C, D, E, F, G, H, I, J, K, L and M show different regions of macro body in a plane, perpendicular to macro body's linear path.

Free atoms in all regions in macro body orient themselves in the direction of macro body's linear motion. As it is a mechanical action, free atoms orient at random with same electric charge facing forward or rearward. Resultant of secondary electrical fields in different regions may have different polarity. As shown in figure 2, resultant of secondary electric fields in regions A, B, E, F, H, M and K have their positive charge facing rearward. Similarly, resultant of secondary electric fields in regions C, D, L, G, J and I have their negative charge facing rearward.

Together, these resultant electric fields, shown in curved arrows in dashed lines, may create resultant electric fields about the macro body in all planes, perpendicular to direction of macro body's motion. Lines of force of distortion-fields exist around macro body, in all planes perpendicular to direction of its

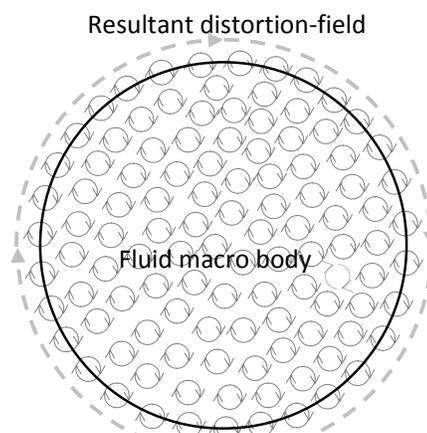


Figure 1

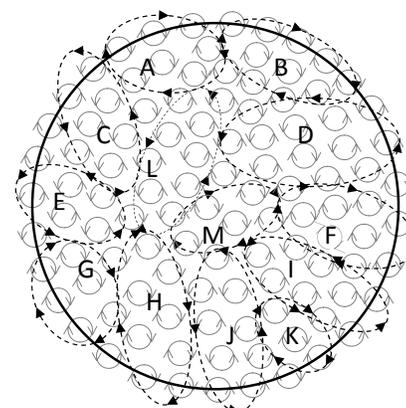


Figure 2

linear motion. It is an angular distortion-field with lines of force of very low curvature. Due to low curvature of lines of force, magnetic nature of distortion-field is prominent. As fluid macro body is sufficiently large, resultant distortion-field around the macro body appears as magnetic field, whose lines of force proceed around macro body, without definite magnetic poles.

Let interior of large macro body, moving at a considerable linear speed, consist of viscous fluid or solid matter and low-density fluid cover its surface, as shown in figure 3. As free atoms in viscous fluid and solid matter are not free to re-orient themselves, only those free floating atoms in surface region of (fluid) macro body align their secondary electric fields with direction of macro body's motion. Therefore, interior of macro body does not take part in creation of resultant distortion-field about it.

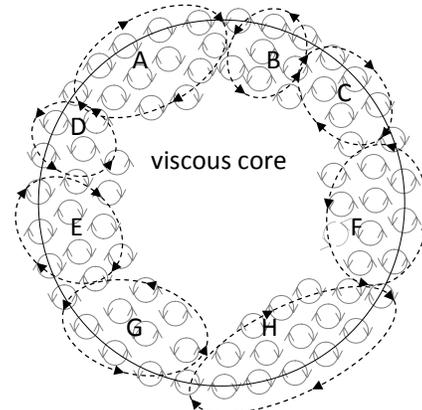


Figure 3

Let us assume that surface of a linearly-moving macro body is uniformly covered with fluid matter of low viscosity. Freely suspended atoms in fluid matter tend to line-up in the direction of macro body's linear motion. As such alignments are at random, direction of similar charges of their secondary electric fields may face forward or rearward. Dashed elliptical arrows represent resultant distortion-fields produced due to secondary electric fields of free atoms, floating in different regions of fluid parts of macro body.

Different regions on surface of macro body may produce resultant electric fields of different directions and magnitudes. In figure 3, in the plane shown, resultant electric fields in regions A, C, E and H are in clockwise direction and in other regions resultant electric fields are in opposite direction. Resultant electric fields in regions A and H are of higher magnitudes; in regions C, E, F and G are of medium magnitudes and in regions B and D are of small magnitudes.

Grand resultant electric field of all resultant electric fields of different regions is around the whole macro body. Such resultant electric fields may be present in every plane, perpendicular to direction of macro body's linear motion. It is an angular distortion-field with lines of force of very low curvature. Due to low curvature of lines of force, magnetic nature of distortion-field is prominent. As the macro body is sufficiently large, resultant distortion-field around it appears as magnetic field, whose lines of force proceed around macro body, without definite magnetic poles.

Figure 4 shows a large linearly-moving macro body with viscous core, looking at from its rear. Surface of macro body is covered uniformly by fluid matter of low viscosity. Let this macro body be spinning about an axis XX, perpendicular to direction of its linear motion. Upper region, in the figure, recedes from and the lower region approaches observer. Tangential speed due to spin motion adds to upper (in figure) region's linear speed and tangential speed due to spin motion deducts from lower (in figure) region's linear speed. However, all regions in macro body moves linearly in same direction – away from observer.

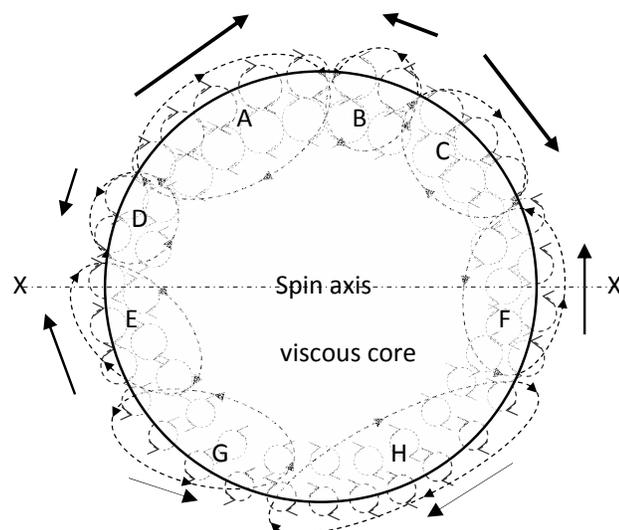


Figure 4

Difference in linear speeds at various surface regions affects independent floating free atoms in fluid matter differently. More free atoms are re-oriented at faster rate in regions of higher linear speed. Thus, for same number of free atoms in a region, upper regions (in figure) have greater number of re-oriented free atoms, compared to middle regions. Lower regions (in figure) have lesser number of re-oriented free atoms compared to middle regions.

Resultant electric fields, in any region, depend on number of secondary electric fields, surviving neutralization. Let us assume that magnitude of resultant electric field in a region is proportional to number of free floating atoms in the region. Relative strengths of distortion-fields in various regions in the plane shown are represented by straight arrows of different widths, associated with each region in figure. Similar distortion-fields are produced in all regions in every plane, perpendicular to direction of linear motion of macro body. They are angular distortion-fields with lines of force of very low curvature. Due to low curvature of lines of force, magnetic nature of distortion-fields is prominent. As the macro body is sufficiently large, resultant distortion-fields about different regions appear as magnetic field without definite magnetic poles.

All very large macro bodies have most of natural chemical elements as their constituents, in various physical states. Ferrous matter constitutes greater part of their cores. Ferrous materials are easily affected by magnetic fields. Continuous exposure to magnetic fields in same direction is likely to have more or less permanent effect on them. Ferric core of a large macro body, exposed to magnetic lines of force in same direction, continuously for some time, is likely to acquire permanent magnetism of its own.

Differences in (absolute) linear speeds of 3D matter-particles, at various locations in a large macro body, with respect to its spin axis, appear as spin motion of macro body (shown in figure 4) about an axis through macro body and perpendicular to its direction of linear motion. Due to apparent spin motion of macro body, lines of force of distortion-fields, in the direction of (parallel to and all around) spin axis, in planes perpendicular to macro body's direction of linear motion, are the only ones that keep steady relative direction with macro body's spin axis. Directions of lines of force of all other resultant distortion-fields about various regions of macro body are intermittent about macro body's spin axis. They cannot contribute towards permanent magnetism of ferric interior of macro body. Effects of these distortion-fields on ferric interior are of temporary nature. Therefore, only those distortion-fields, whose lines of force keep steady directions with respect to macro body's spin axis, need to be considered for residual magnetism of its ferric core. Lines of forces of steady magnetic field are limited to planes containing (and parallel to) macro body's spin axis and perpendicular to direction of its linear motion.

Figure 5 shows resultant distortion-fields about a plane of linearly moving, spinning macro body. View is from rear of macro body. Upper region of macro body, in figure, has higher linear speed (receding from observer) and lower region of macro body, in figure, has lower linear speed (approaching observer). Macro body is assumed to have a ferric core. Resultants of distortion-fields on either side of spin axis (in a plane) are shown by black dashed ellipses with arrows in direction of lines of force. As shown in figure, lines of force of resultant distortion-fields are identical (both are clockwise). Directions of magnetism, affected by lines of force near macro body's surface are shown by thick gray arrows. Since directions are opposite in upper and lower part of plane, with respect to macro body's spin axis, part of greater resultant distortion-field tend to neutralize smaller resultant distortion-field.

Remaining part appears as overall resultant magnetic field of macro body, as shown by thick block arrow.

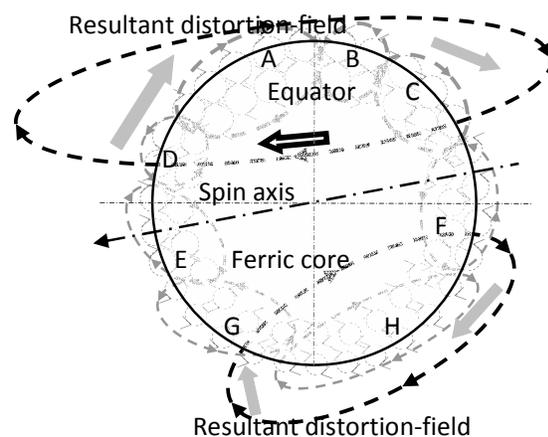


Figure 5

Direction of overall magnetism, with respect to macro body's spin axis is shown by centre line with arrow. If resultant distortion-fields are dissimilar, they enhance each other along spin axis of macro body and macro body acts as a single magnet.

Ferric matter in macro body's core, being under steady directions of distortion-fields, is affected by them. Gradually, core region of macro body attains permanent magnetism corresponding to overall resultant distortion-field as shown by thick block arrow in figure. Magnitude of induced magnetic field in macro body's core region not only depends on magnitudes and relative directions of distortion-fields about upper and lower hemispheres of macro body but also on its ferric content, relative motions and distribution within macro body. As macro body apparently spins about its axis, these factors vary continuously. Parameters of distortion-fields, created within macro body, vary from instant to instant. Presence of ferric core of macro body and magnetism induced in it stabilizes and sustains strength and direction of magnet, formed about macro body, to an average magnitude and direction.

Terrestrial magnetism:

With respect to absolute reference, a spinning macro body that has no translational displacement is a hypothetical entity. Such a hypothetical macro body, assumed with respect to relative reference frame about its spin axis may provide a simpler (but not real) explanation of creation of magnetic field about a spinning planetary body. In this case, planetary body's linear motion is ignored and only its spin motion about its spin axis is considered. However, real magnetizing action of macro body is as described above.

A very large spinning fluid macro body in space is a huge collection of atoms of various elements and molecules of elements or compounds. Inter-particle gravitational attractions, during formation of large macro bodies, shape them roughly as spheres. Uneven motion of 3D matter-particles, during formation of a large macro body, initiates its spin motion. Since all free macro bodies (except stable galaxies) in space have linear motion. Planetary body, considered here, is an assumed spinning macro body that is steady in space without translational motion.

Most atoms and molecules in planetary bodies are held rigidly in its solid matter, some others are held loosely in liquid matter and yet some others are more freely floating as in gases. Due to definite orientation of atoms with respect to each other, in small groups in solid parts, planetary body as a whole appears as electrically neutral. However, atoms and molecules in fluid parts of planetary body are held to each other loosely and hence they have certain freedom for relative movements.

Matter is inert. It is the transfer of distortions in universal medium, about a planetary body, that is carrying its constituent 3D matter-particles to move whole of macro body as an integrated entity. Distortions in universal medium tend to choose easiest path for their transfer. Due to fluid nature of universal medium and tubular shape of atoms, all loosely held (independent) atoms in fluid-part of a rotating planetary body tend to line up in directions parallel to direction of their linear motion in circular path. During spin motion of planetary body, free floating atoms in its fluid parts orient themselves in east-west direction.

Orientation of free floating atoms is a simple mechanical arrangement, required for easiest path for transfer of distortions in universal medium. 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 equatorial region (due to lower speed of regions of higher latitudes and inner regions may be disregarded) of spinning macro body, tend to line up with their axes along their circular paths (in east-west direction).

Most atoms and molecules of a planetary body have secondary electric fields about them. Secondary electric fields of re-oriented atoms have their similar electric charges facing forward or rearward. Resultant of secondary electric fields of all these atoms forms an electric current along equator of spinning planetary body, forming a loop around it. Arrangement of secondary electric fields, around spinning macro body along lines parallel to its equator, appears as a resultant electric current. This loop of electric field produces a resultant magnetic field along macro body's spin axis. In fact, resultant

magnetic field is resultant electric field itself, acting beyond its 'zilch-effort distance' and hence acts like magnetic field.

Electric fields in each plane, being circular, appearance of electric current loop along any line, parallel to planetary body's equator, may be likened to number of circular discs, linked face to face, all around and parallel to equator, as (two secondary electric fields placed diametrically opposite sides about the equator) shown in figure 6. Resultant of secondary electric fields produces resultant distortion-field as shown by dotted curved lines in figure. Curvature of circular lines of force being very small, a small part of it, acts as a linear line of force. Resultant distortion-field exhibits more of its magnetic nature and less of its electric nature. In other words, this distortion-field acts as a magnetic field.

Number of lines of force through planetary body, about its equator (or lines of latitude, parallel to equator), in one direction and equal number of lines of force outside planetary body in opposite direction produce a magnet through spinning planetary body as shown by the arrows, N and S. This is the magnetic field of a spinning planetary body.

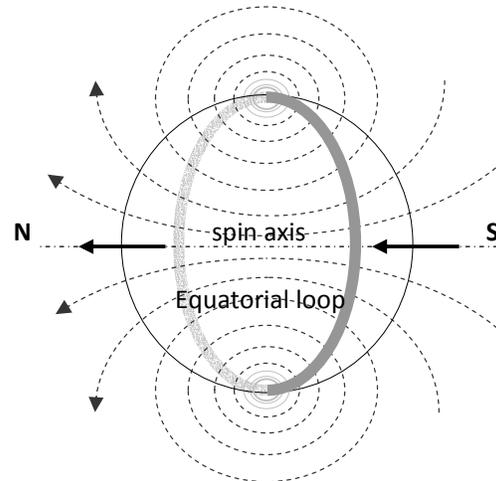


Figure 6

Earth's magnetic field is produced by east-west alignment of free atoms on or near its surface, in equatorial region. Alignment of these atoms is purely a mechanical action and there is nothing to prevent them from orienting their electric charges in any of two possible directions – same electric charge facing east or west. This is what happens and secondary electric fields of most of re-oriented atoms, being in opposite directions, neutralize each other. Secondary electric fields are not strong enough to prevent re-orientation of atoms against inter-atomic bonds. Only those secondary electric fields, which are not neutralized, contribute towards earth's magnetism. Hence, earth's magnetic field is very weak and varies, depending on many factors affecting alignments and orientations of free floating atoms near its equatorial surface. Similar phenomenon causes galactic magnetic field. In this case, magnetic field is caused by east-west alignment of primary electric fields of bitons, which are very strong, in galactic halo.

Interior of earth is in liquid state. Magma below its crust is very dense and hence, free floating atoms in it may not be free enough to re-orient themselves along the direction of earth's spin (linear) motion. Magma, being nearer to earth's spin axis, its apparent spin speed is relatively low. We may, for the present, disregard contribution of free atoms in magma towards planetary magnetism.

Atmospheric gases are unsteady and are mostly in agitated state. Hence, free atoms in it cannot contribute much towards development of earth's magnetism. Liquids or low-density fluid matter on earth's surface (like: ocean waters) are relatively calm and carry atoms of most elements in free form. Agitation of ocean water is mainly limited to its upper surface. Hence, free floating atoms in ocean water (below upper surface) tend to remain aligned in the direction of earth's spin (linear) motion. So, it is the ocean water in equatorial region of apparently spinning earth that (mainly) helps to form its magnetism.

Earth's solid matter, contrary to present belief, cannot contribute towards creation of its magnetic field. Conversely, it is affected by 'created' magnetism and helps to stabilize and sustain continuity of magnetism about earth. Magnetic field, produced in any region (on surface) of earth, is roughly proportional to quantity and apparent tangential speed of ocean water in that region.

Most of larger planetary and central bodies are spherical in shape. A spherical planetary body has two hemispheres on either side of its equator. We shall take southern hemisphere of earth, as shown in figure 7, for discussion.

Let B and C are two points on earth's surface on same latitude. Similarly let A and D are two other points on earth's surface at higher latitude. For time being, let us suppose that ocean water is calm and its consistency is identical throughout this region. Free floating atoms in ocean water produce magnetic fields, whose strength is (roughly) proportional to quantity of ocean water at these points.

Let strengths of magnetic fields at these points and their directions are represented by arrows $A'AA'$, $B'BB'$, $C'CC'$ and $D'DD'$ in dashed lines. Direction of lines of force of magnetic field, produced at a point near earth's surface, is tangential to earth's surface at that point. Similar magnetic fields are produced at every point on earth's surface, wherever large quantity of water is present. These magnetic fields, in turn, induce nearby ferrous core with permanent magnetism. Resultant of all these magnetic fields, produced in the southern hemisphere is shown by grey arrow EE' .

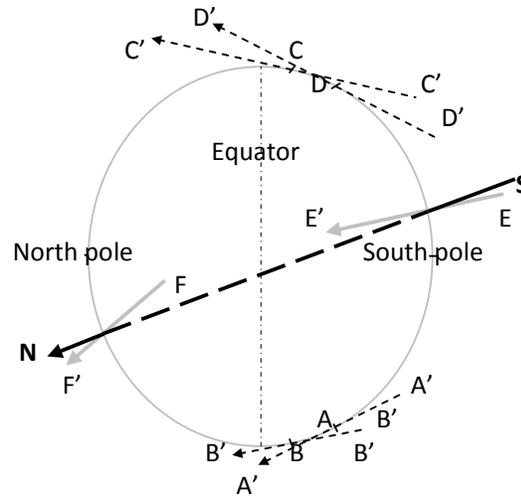


Figure 7

Similarly ocean water on earth's northern hemisphere also produce its own resultant magnetic field and induce core matter with permanent magnetism in the direction of grey arrow FF' . Difference in directions of permanent magnetism, from earth's spin axis, is due to difference in quantity of ocean water at different points on surface and quantity and distribution of ferric core in earth.

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

Axis of magnetic field EE' in figure 7, which is the resultant of all sustained magnetic fields of southern hemisphere, has one of its pole near (in the direction of) earth's south geographical pole and other pole some where inside and near earth's center. Similarly magnetic axis of northern hemisphere has one of its poles near (in the direction of) earth's northern geographical pole and other pole somewhere near earth's center. These apparent magnetic fields, together, produce earth's magnetic field, whose axis is along dashed line NS , shown in figure. Line NS represents earth's magnetic axis.

Since 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 these parameters, independent of others. Natural upheavals in surface fluid-matter or gradual changes in its distribution are likely to affect strength and direction of earth's magnetism. Any change in earth's magnetism due to variations in structure of solid crust or core is likely to be of temporary nature.

Relative spin speed of a planetary body, about its spin axis, greatly influences east-west alignment of free floating atoms. Hence, planetary bodies with greater relative spin speed have greater chances to have stronger magnetic fields. Planetary bodies with no spin motion or are spinning at very low speed have least self-induced magnetism. However they may exhibit magnetic property, induced by their linear

motion or induced by surrounding magnetic fields extending from other macro bodies. Ferric content of a planetary body influences maintenance of its permanent magnetism. Greater ferric content enhances magnitude of planetary magnetism.

Main parameters, to determine magnitude of planetary magnetism created in any direction, are number of free floating atoms in fluid-matter and their relative directions. This information is very difficult to obtain. Further, magnetic strength in a hemisphere cannot be measured in isolation. Hence, it is almost impossible to determine magnitude of planetary magnetism (due to relative spin motion) from fundamental parameters. Magnetic strength is further influenced by ferric content of planetary body's core and its distribution and movements. Rough relative strength and direction may be determined from known distribution of relatively calm fluid-matter on planetary body's surface. Very large planetary bodies and stars are wholly fluid and they have very dense atmosphere, which may also contribute towards their magnetism. This helps them to have much stronger magnetism.

All macro bodies in space are condensed from galactic clouds. Smaller macro bodies condense to solid state. If a small macro body happens to have high linear or spin speed, during its condensation period, free floating atoms in it tend to line up in the direction of macro body's motion. Since small macro body condenses to solid form, free atoms in it are frozen with their axes in the direction of its motion. Alignment of these atoms may provide the small macro body with a permanent magnetism. Direction of this magnetic field is perpendicular to direction of its motion, at the time of formation of magnetic field. Such small macro bodies (even if they become members of a planetary system), retain certain magnitude and direction of their magnetic fields constant, irrespective of any changes in their parameters (later in their life), like: changes in direction of macro body's axis, changes in magnitude and direction of its motions, etc.

Conclusion:

Linear motion of a planetary body is extremely large compared to its spin motion. Hence, with respect to absolute reference, every particle in a planetary body move in the same direction and spin motion of the planetary body is an apparent phenomenon. Planetary magnetism of an apparently spinning planet is the result of free floating atoms in relatively calm fluid on or about its surface. Magnetic field, created by secondary electric fields of free floating atoms is sustained by induced magnetism of ferric content of planetary body's crust and core. Magnitude of resultant magnetism depends on the apparent spin speed of macro body, quantity of calm fluid on its surface and ferric content of its solid/core part. Similar magnetic fields are present on all large, apparently spinning bodies with ferric core, which have a relatively calm fluid on it. Since all very large bodies are fluid throughout, they are likely to exhibit greater magnetism.

Reference:

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

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