

PLANETARY MAGNETISM

According to 'MATTER Re-examined'

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Abstract: It is generally believed that planetary magnetism is the result of the motion of molten iron alloys in a planetary body's core region. An assumed dynamo mechanism, in the core region of a planetary body, generates a magnetic field by a feedback loop: electric current loops in the region create a magnetic field, and the magnetic loops in turn create the electric fields. This assumption uses circular logic. As the linear speed of a spinning planetary body is much greater than the (tangential) linear motion of its constituent 3D matter-particles due to the planetary body's spin speed, every 3D matter-particle in the spinning planetary body always moves in the same direction in space. The spin motion of a planetary body is an illusion, and it is valid only for considerations with respect to a static reference of the planetary body's spin axis. The real motion of all 3D matter-particles of a spinning planetary body (with respect to absolute reference) is always in the same linear direction; the swirling motion of a planetary body's interior is a myth. To consider this imaginary swirling motion of a planetary body's magma as the cause of planetary magnetism is not tenable. Even for the dynamo effect to occur, a primary source of magnetism is required, which is absent in this case. The cause and nature of planetary magnetism, described in this article, are based on a radically different concept, presented in the book 'MATTER (Re-examined)'. For details, kindly refer to the same [1].

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

Introduction:

Quanta of (unstructured) matter constitute observable 3D material bodies and a universal medium, which fills the entire space. Universal medium creates and sustains 3D matter-particles. Universal medium has all properties of an ideal fluid. All apparent interactions between 3D material bodies take place through the universal medium, which is in direct contact with every 3D matter-particle in nature. This avoids the 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 the type of their average structural deformations. Depending on the nature of structural distortions in the universal medium, distortion-fields are classified into linear (magnetic field), angular (electric field), and radial (nuclear field) distortion-fields.

A free body is that macrobody, which is free from all external influences other than the efforts/actions considered. All movements are considered with respect to absolute reference (a static point in the universal medium). Figures in this article are drawn not to scale. They are intended to depict the actions described. The adjective 'inertial' means an action related to the motion of 3D material 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 to and approaching the positrons in the nucleus of an atom, cause and maintain the spin motion of the nucleus about its longitudinal axis. Orbital electrons of an atom form another tubular structure around the nucleus. Thus, all (larger) atoms are tubular structures made of circular sections of different girth. The development of the nucleus of an atom depends on the availability of constituent fundamental 3D matter-particles and continues until the distortion-fields, about

the nucleus, achieve neutral status. In certain cases, the left-over distortion-fields in fully formed individual atoms are neutralised by the formation of molecules, with similar or different type of atoms.

Although a stable nucleus of an independent atom is electrically neutral within itself, its spin motion creates an external resultant (secondary) electric field about it. During the high-speed linear motion of free (tubular) atoms through the universal medium, their axes tend to align in the direction of their linear motion. This alignment provides the least resistance to their motion through the 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, the nucleus spins about its axis, and orbital electrons revolve around the nucleus about the same axis. Each of the axially placed positrons in the nucleus and electrons in orbits around the nucleus not only has its electric field in planes perpendicular to the nuclear axis, but it is also taken around the axis, once every rotation of the nucleus. Hence, all electric fields, which are in the direction of the spin of the nucleus, gain an additional angular displacement of one turn, and all those electric fields, which are in the opposite direction to the spin of the nucleus, lose an angular displacement of one turn during every rotation of the nucleus. Changes in the magnitude of angular motion of an electric field are an increment or a reduction in the magnitude of distortion-density (in the direction of its lines of force).

Such turning motions of the electric fields mean that the concerned electric field (resultant electric field of the 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 the 'secondary electric field'. Thus, any atom with axially arranged deuterons in its nucleus and corresponding electrons in the 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 the formation of molecules, during which they may be neutralized. However, certain types of stable atoms are able to maintain their individuality and remain independent. These atoms exhibit secondary electric fields around them. Although the secondary electric field, about an atom, is too small to be noticed, when a great many atoms, spinning in the same direction, are accumulated in a region, their secondary electric fields may give rise to a reasonably strong resultant electric field.

Magnetic field about a moving macrobody:

Let us consider a free fluid macrobody, moving in a straight line at a reasonably high speed. All fluid macro bodies in free space acquire a spherical shape. Generally, a large composite fluid macrobody 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 the macrobody. By orienting themselves in this fashion, they experience the least resistance from the universal medium to their motion. In fact, it is the universal medium that is moving all atoms in the macrobody, and the universal medium chooses the most efficient method to move them.

Orientation of free atoms is a mechanical action, and their identical electric charges, due to the 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 macrobody, which are not inactivated, together form a resultant electric field about the moving fluid macrobody. Depending on its composition, a very large fluid macrobody is likely to have one or more resultant electric fields about it in the planes perpendicular to its direction of motion.

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

Since all secondary electric fields are in phase with each other, together they produce resultant electric fields in all planes perpendicular to the direction of the macrobody's linear motion. Lines of force of the

resultant distortion-field exist around the macrobody in all planes perpendicular to the direction of its motion. It is an angular distortion-field with lines of force of very low curvature. Due to the low curvature of lines of force, the magnetic nature of distortion-field is prominent. As the fluid macrobody is sufficiently large, resultant distortion-fields around it appear as a magnetic field, whose lines of force proceed around the macrobody, without definite magnetic poles.

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

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

Free atoms in all regions of the macrobody orient themselves in the direction of the macrobody's linear motion. As it is a mechanical action, free atoms orient at random with the same electric charge facing forward or rearward. The resultant of secondary electrical fields in different regions may have different polarities. As shown in Figure 2, the resultant of secondary electric fields in regions A, B, E, F, H, M, and K have their positive charge facing rearward. Similarly, the 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 macrobody in all planes perpendicular to the direction of the macrobody's motion. Lines of force of distortion-fields exist around the macrobody, in all planes perpendicular to the direction of its linear motion. It is an angular distortion-field with lines of force of very low curvature. Due to the low curvature of lines of force, the magnetic nature of the distortion-field is prominent. As the fluid macrobody is sufficiently large, the resultant distortion-field around the macrobody appears as a magnetic field, whose lines of force proceed around the macrobody, without definite magnetic poles.

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

Let us assume that the surface of a linearly moving macrobody is uniformly covered with fluid matter of low viscosity. Freely suspended atoms in fluid matter tend to line up in the direction of the macrobody'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 the secondary electric fields of free atoms, floating in different regions of fluid parts of the macrobody.

Different regions on the surface of the macrobody 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 a clockwise direction, and in other regions, resultant electric fields are in the 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.

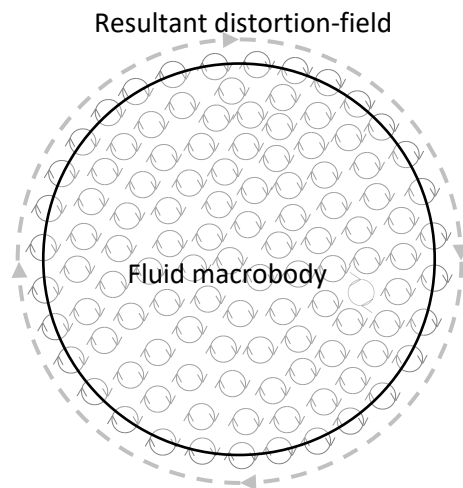


Figure 1

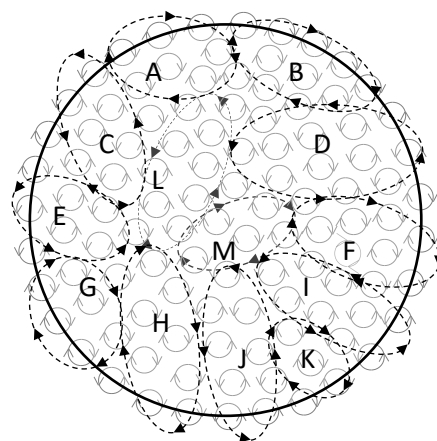


Figure 2

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

Figure 4 shows a large linearly moving macrobody with a viscous core, looking at it from its rear. The surface of the macrobody is covered uniformly by fluid matter of low viscosity. Let this macrobody be spinning about an axis XX, perpendicular to the direction of its linear motion. The upper region, in the figure, recedes from the observer, and the lower region approaches the observer. Tangential speed due to spin motion adds to the upper (in the figure) region's linear speed, and tangential speed due to spin motion deducts from the lower (in the figure) region's linear speed. However, all regions in the macrobody move linearly in the same direction – away from the observer. The difference in linear speeds at various surface regions affects independent floating free atoms in the fluid matter differently. More free atoms are reoriented at a faster rate in regions of higher linear speed. Thus, for the same number of free atoms in a region, upper regions (in the figure) have a greater number of reoriented free atoms compared to the middle regions. Lower regions (in the figure) have a fewer number of reoriented free atoms compared to the middle regions.

Resultant electric fields, in any region, depend on the number of secondary electric fields surviving the neutralization. Let us assume that the magnitude of the resultant electric field in a region is proportional to the 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 the figure. Similar distortion-fields are produced in all regions in every plane, perpendicular to the direction of linear motion of the macrobody. They are angular distortion-fields with lines of force of very low curvature. Due to the low curvature of lines of force, the magnetic nature of distortion-fields is prominent. As the macrobody is sufficiently large, resultant distortion-fields about different regions appear as a magnetic field without definite magnetic poles.

All very large macrobodies have most of the natural chemical elements as their constituents, in various physical states. Ferrous matter constitutes the greater part of their cores. Ferrous materials are easily affected by magnetic fields. Continuous exposure to magnetic fields in the same direction is likely to have a more or less permanent effect on them. The ferric core of a large macrobody, exposed to magnetic lines of force in the 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 macrobody, with respect to its spin axis, appear as spin motion of the macrobody (shown in figure 4) about an axis through the macrobody and perpendicular to its direction of linear motion. Due to the apparent spin motion of the macrobody, lines of force of distortion-fields, in the direction of (parallel to and all around) the spin axis, in planes perpendicular to the macrobody's direction of linear motion, are the only ones that keep a steady

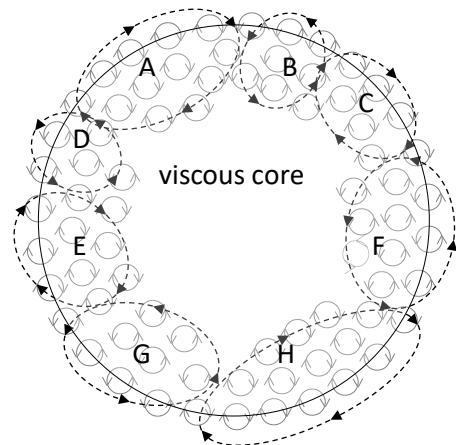


Figure 3

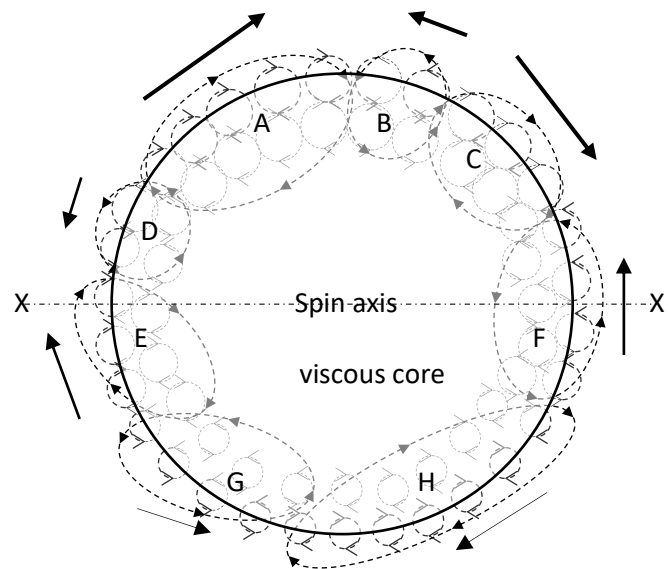


Figure 4

relative direction with the macrobody's spin axis. Directions of lines of force of all other resultant distortion-fields about various regions of the macrobody are intermittent about the macrobody's spin axis. They cannot contribute towards the permanent magnetism of the ferric interior of the macrobody. Effects of these distortion-fields on ferric interior are of a temporary nature. Therefore, only those distortion-fields, whose lines of force keep steady directions with respect to the macrobody's spin axis need to be considered for the residual magnetism of its ferric core. Lines of force of a steady magnetic field are limited to the planes containing (and parallel to) the macrobody's spin axis and perpendicular to the direction of its linear motion.

Figure 5 shows the resultant distortion-fields about a plane of a linearly moving, spinning macrobody. View is from the rear of the macrobody. Upper region of macrobody, in the figure, has higher linear speed (receding from the observer) and the lower region of the macrobody, in the figure, has lower linear speed (approaching the observer). Macrobody is assumed to have a ferric core. Resultants of distortion-fields on either side of the spin axis (in a plane) are shown by black dashed ellipses with arrows in the direction of lines of force. As shown in the figure, the lines of force of resultant distortion-fields are identical (both are clockwise). Directions of magnetism, affected by lines of force near the macrobody's surface, are shown by thick gray arrows. Since the directions are opposite in the upper and lower parts of the plane, with respect to the macrobody's spin axis, parts of greater resultant distortion-field tend to neutralize smaller resultant distortion-field. The remaining part appears as the overall resultant magnetic field of the macrobody, as shown by the thick block arrow. The direction of overall magnetism with respect to the macrobody's spin axis is shown by the centre line with an arrow. If resultant distortion-fields are dissimilar, they enhance each other along the spin axis of the macrobody, and the macrobody acts as a single magnet.

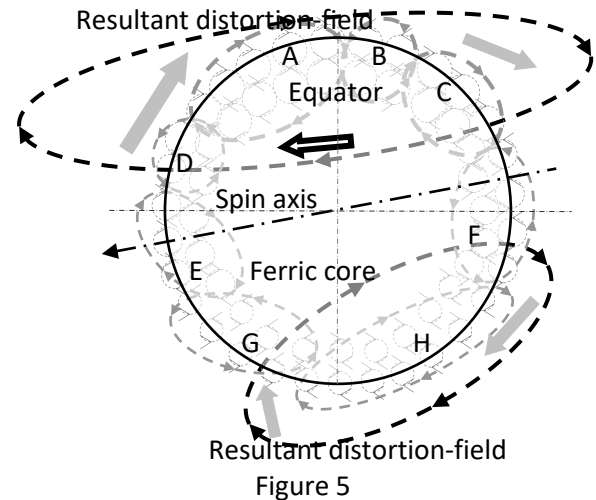


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Ferric matter in the macrobody's core, being under steady directions of distortion-fields, is affected by them. Gradually, the core region of the macrobody attains permanent magnetism corresponding to the overall resultant distortion-field as shown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

Terrestrial magnetism:

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

A very large spinning fluid macrobody in space is a huge collection of atoms of various elements and molecules of elements or compounds. Inter-particle gravitational attractions during the formation of large macrobodies shape them roughly as spheres. Uneven motion of 3D matter-particles, during the formation of a large macrobody, initiates its spin motion. Since all free macrobodies (except stable galaxies) in space have linear motion. Planetary body, considered here, is an assumed spinning macrobody 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 the definite orientation

of atoms with respect to each other, in small groups in solid parts, the planetary body as a whole appears as electrically neutral. However, atoms and molecules in fluid parts of the 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 structural distortions in the universal medium, about a planetary body, that is carrying its constituent 3D matter-particles to move the whole of the macrobody as an integrated entity. Structural distortions in the universal medium tend to choose the easiest path for their transfer. Due to the fluid nature of the universal medium and the tubular shape of atoms, all loosely held (independent) atoms in the fluid part of a rotating planetary body tend to line up in directions parallel to the direction of their linear motion in a circular path. During the spin motion of a planetary body, free-floating atoms in its fluid parts orient themselves in the east-west direction.

Orientation of free-floating atoms is a simple mechanical arrangement required for the easiest path for the transfer of structural distortions in a universal medium. Selection of the easiest path of transfer of structural distortions may be understood as a path for relative motion with the least apparent resistance. All free atoms on or near the equatorial region (due to the lower speed of regions of higher latitudes and inner regions may be disregarded) of a spinning macrobody tend to line up with their axes along their circular paths (in the east-west direction).

Most atoms and molecules of a planetary body have secondary electric fields about them. Secondary electric fields of reoriented atoms have similar electric charges facing forward or rearward. The resultant of the secondary electric fields of all these atoms forms an electric current along the equator of the spinning planetary body, forming a loop around it. Arrangement of secondary electric fields around a spinning macrobody along lines parallel to its equator appears as a resultant electric current. This loop of electric field produces a resultant magnetic field along the macrobody's spin axis. In fact, the resultant magnetic field is the resultant electric field itself, acting beyond its 'zilch-effort distance' and hence acting like a magnetic field.

Electric fields in each plane, being circular, the appearance of an electric current loop along any line, parallel to the planetary body's equator, may be likened to a number of circular discs, linked face to face, all around and parallel to the equator, as (two secondary electric fields placed diametrically opposite sides about the equator) shown in figure 6. The resultant of secondary electric fields produces a resultant distortion-field as shown by dotted curved lines in the figure. Curvature of circular lines of force being very small, a small part of it acts as a linear line of force. The 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 the planetary body, about its equator (or lines of latitude, parallel to the equator), in one direction and an equal number of lines of force outside the planetary body in the opposite direction produce a magnet through a spinning planetary body, as shown by the arrows, N and S. This is the magnetic field of a spinning planetary body.

Earth's magnetic field is produced by the east-west alignment of free atoms on or near its surface in the equatorial region. Alignment of these atoms is purely a mechanical action, and there is nothing to prevent them from orienting their secondary electric charges in any of two possible directions – the 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 reorientation of atoms against inter-atomic bonds. Only those secondary electric fields that are not neutralized contribute to Earth's magnetism. Hence, Earth's magnetic field is very weak and varies, depending on many factors affecting the alignments and orientations of free-floating atoms near its equatorial surface. A similar phenomenon causes the galactic magnetic field. In this case, the magnetic field is caused by the east-west alignment of primary electric fields of bitons, which are very strong, in the galactic halo.

The interior of the Earth is in a liquid state. Magma below its crust is very dense, and hence, free-floating atoms in it may not be free enough to reorient themselves along the direction of the Earth's spin (linear) motion.

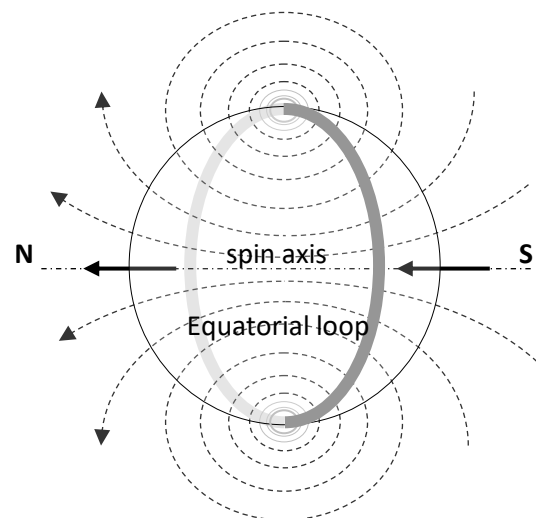


Figure 6

Magma, being nearer to Earth's spin axis, has an apparent spin speed that is relatively low. We may, for the present, disregard the contribution of free atoms in magma towards the planetary magnetism.

Atmospheric gases are unsteady and are mostly in an agitated state. Hence, free atoms in it cannot contribute much towards the 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 the ocean water (below the upper surface) tend to remain aligned in the direction of the Earth's spin (linear) motion. So, it is the ocean water in the equatorial region of the apparently spinning earth that (mainly) helps to form its magnetism.

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

Most of the 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 the southern hemisphere of Earth, as shown in Figure 7, 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 Earth's surface at a higher latitude. For the time being, let us suppose that ocean water is calm and its consistency is identical throughout this region. Free-floating atoms in the ocean water produce magnetic fields, whose strength is (roughly) proportional to the quantity of ocean water at these points.

The 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. The direction of the lines of force of the 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 a large quantity of water is present. These magnetic fields, in turn, induce a nearby ferrous core with permanent magnetism. The resultant of all these magnetic fields, produced in the southern hemisphere, is shown by the grey arrow EE' .

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

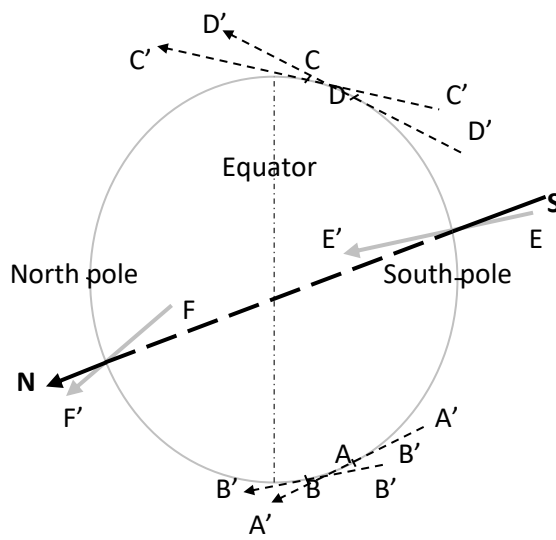


Figure 7

At every point on Earth's surface, the magnetic field is tangential to Earth's surface. All magnetic fields, produced and sustained at a certain latitude around Earth's surface, form the 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 the outer poles of magnets (in space, away from Earth). At the inner poles of magnets (which are towards the planetary body's equator), lines of force spread out around Earth's equator. Separation of hemispheric magnetic fields is due to the curvature of the 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 the southern hemisphere, has one of its poles near (in the direction of) Earth's south geographical pole and the other pole somewhere inside and near Earth's center. Similarly, the magnetic axis of the northern hemisphere has one of its poles near (in the direction of) Earth's northern geographical pole and the other pole somewhere near Earth's center. These apparent magnetic fields, together, produce Earth's magnetic field, whose axis is along the dashed line NS , shown in the figure. Line NS represents Earth's magnetic axis.

Since the magnetic field of each hemisphere is separate and independent, the 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 the strength and direction of the Earth's magnetism. Any change in Earth's magnetism due to variations in the structure of the solid crust or core is likely to be of a temporary nature.

Relative spin speed of a planetary body, about its spin axis, greatly influences the east-west alignment of free-floating atoms. Hence, planetary bodies with a greater relative spin speed have a greater chance of having stronger magnetic fields. Planetary bodies with no spin motion or that are spinning at very low speed have the least self-induced magnetism. However, they may exhibit magnetic property, induced by their linear motion or induced by surrounding magnetic fields extending from other macrobodies. The ferric content of a planetary body influences the maintenance of its permanent magnetism. Greater ferric content enhances the magnitude of planetary magnetism.

The main parameters to determine the magnitude of planetary magnetism created in any direction are the 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 the magnitude of planetary magnetism (due to relative spin motion) from fundamental parameters. Magnetic strength is further influenced by the ferric content of a planetary body's core and its distribution and movements. Rough relative strength and direction may be determined from the known distribution of relatively calm fluid-matter on a planetary body's surface. Very large planetary bodies and stars are wholly fluid, and they have very dense atmospheres, which may also contribute to their magnetism. This helps them to have much stronger magnetism.

All macrobodies in space are condensed from galactic clouds. Smaller macrobodies condense into a solid state. If a small macrobody 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 the macrobody's motion. Since a small macrobody 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 macrobody with permanent magnetism. The direction of this magnetic field is perpendicular to the direction of its motion at the time of formation of the magnetic field. Such small macrobodies (even if they become members of a planetary system) retain the magnitude and direction of their magnetic fields constant, irrespective of any changes in their parameters (later in their life), like changes in the direction of the macrobody's axis, changes in the magnitude and direction of its motions, etc.

Conclusion:

The 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 moves in the same direction, and the 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. The magnetic field, created by secondary electric fields of free-floating atoms, is sustained by the induced magnetism of the ferric content of the planetary body's crust and core. The magnitude of resultant magnetism depends on the apparent spin speed of the macrobody, the quantity of calm fluid on its surface, and the ferric content of its solid/core part. Similar magnetic fields are present on all large, apparently spinning bodies with a ferric core, which have relatively calm fluid on them. Since all very large bodies are fluid throughout, they are likely to exhibit greater magnetism.

Reference:

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

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