ORIGIN OF PLANETARY MAGNETISM

Prof. Márcio Antônio Sens – marciosens@id.uff.br
UFF - Federal Fluminense University – Niterói - Brazil

Abstract

The rationale behind the presence or absence of a magnetic field by a celestial body is elucidated in this article. It is also possible to find out if an incandescent core exists and, if so, how the inner core rotates relative to the main body. An incandescent body in motion can create magnetic fields that align with the axis of rotation by moving electrical charges in separate layers. Electric currents or the movement of electric charges within the bodies are not required for generating magnetic fields, but rather the movement of these charges with the rotating body.

Keywords: Geomagnetism, planets, origin, reversal, geodynamo, nature.

Summary

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1 Introduction

Man has been trying to figure out why the bodies of the solar system have magnetism. Some planets exhibit their own magnetism, while others do not. Some celestial bodies, like the Moon, don´t have their own magnetic field now, but their rocks have shown that this satellite once did.

The purpose of this work is scientific, but it is written in a highly technical style, reminiscent of the usual technical reports prepared by the author, who has over 50 years of expertise in experimental electromagnetic devices. The guidelines outlined herein apply to all celestial bodies; however, the article is restricted to the eight planets of the Solar System, neglecting the dwarf planets. To date, no theory about the origins of geomagnetism has been proven experimentally, so conclusions about the magnetism of celestial bodies have been based only on the hypotheses that rotating incandescent bodies can create a magnetic field aligned with the axis of rotation.

It should be noted that the numerous theories that seek to justify the own magnetism of celestial bodies are out-dated, are over a hundred years old, and have never been demonstrated experimentally.

A critical analysis of the various theories about the origin of geomagnetism revealed that only one hypothesis was capable of explaining all the effects observed in the magnetism of planets: the hypothesis that magnetism can be generated by the rotation of an incandescent solid body around its axis[1].

The hypothesis considered here is based on the hypothesis left by Albert Einstein in 1905, as cited by some sources, without much detail where it was recorded, that geomagnetism must be related to the separation of electric charges. This is, in fact, true. Thomas Edison (1880) had already realized that electric charges could be separated by thermionic emission. The inner core is an incandescent body with a thermionic emission.

The most previously accepted theory of the self-excited geodynamo[2], on the other hand, fails to hold water, as no experiment has ever provided any proof that validates this hypothesis, or conjecture.

If we accept the idea, even provisionally, that a solid, incandescent body can create magnetic fields simply by rotating around its axis, it would explain the existence or not of magnetism itself in all celestial bodies.

The subject of magnetic reversals is attracting a lot of attention from the curious, and, in a quick search, as of January 2024, there are approximately 23,330 results for the subject "Earth Magnetic Reversal", of which 643 results are news and 189 are video results.

2 Birth of Planets and Celestial Bodies

In the Solar System, all planets and satellites were created simultaneously, in a single, large explosion. This idea is accepted by everyone, but it can´t be proven experimentally. But, if this is believed, it is also accepted that all these celestial bodies were born incandescent and that they began to revolve around themselves and around the Sun. Initially, everything was an incandescent mass; however, over time, it subsided and assumed an approximate spherical form. These bodies began to cool from the outside in, starting to have a liquid mass and a solid mass inside. The central core of such celestial bodies remained incandescent for more or less time because it was the last to cool down and stabilize the equilibrium temperature. The entire Solar System revolves in a counter clockwise direction, except for Venus. Venus is the only planet with a retrograde rotation, unlike all the others. Five of the eight planets, excluding the dwarf planets, exhibit significant self-magnetism. The illustration of **Figure 1** depicts the solar system with the eight planets, as represented by their sizes and hues.

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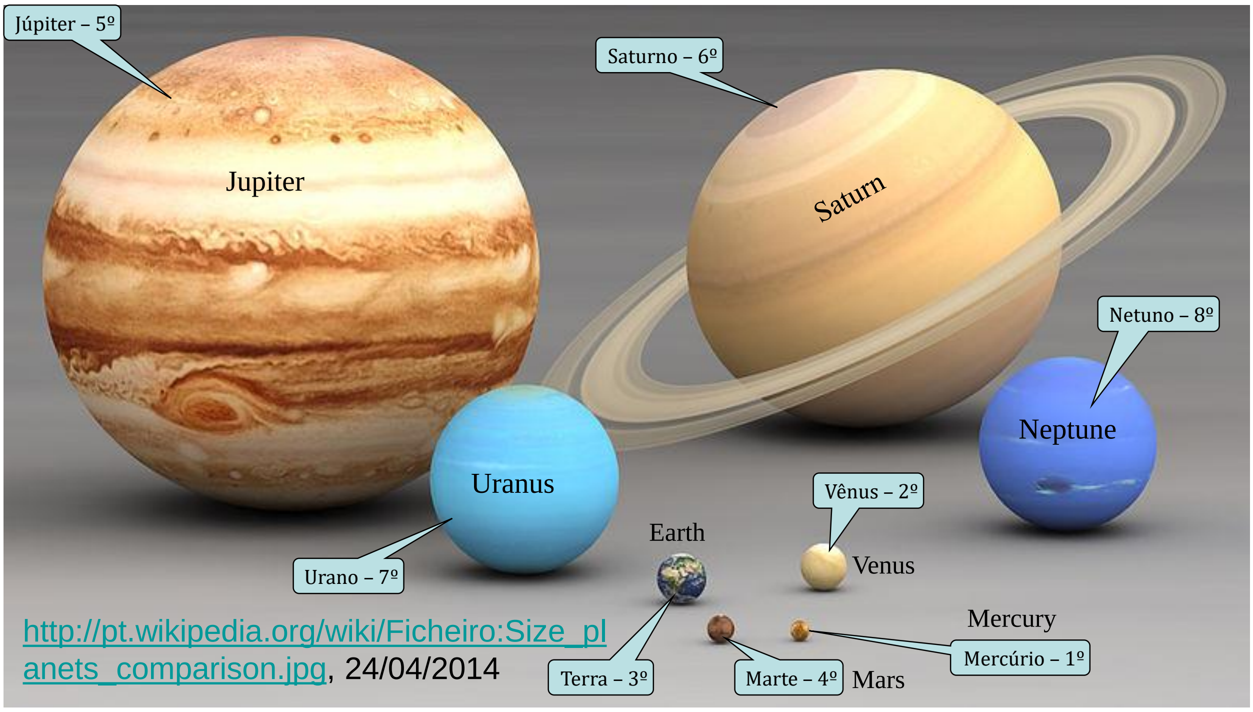

FIGURE 1 – PLANETS OF THE SOLAR SYSTEM – ORDER

3 The Origin of the Magnetism of Planets and Satellites

Recent published research shows that all incandescent celestial cups, rotating around themselves, exhibit or have exhibited a magnetic field aligned with the axis of rotation of their incandescent core [3].

Due to this premise, a celestial body, to exhibit its own magnetism, would have to meet the following requirements:

a) Contain a solid body, or core;
b) This core would have to be incandescent;
c) The nucleus would have to rotate around its axis;
d) The magnetism generated would increase with rotation; and
e) The magnetism generated would be highly dependent on temperature.

4 The Electromagnetic Mathematical Simulations

There is ample evidence that the Earth has a glowing inner core with temperatures around 5000 °C. From space over the Arctic pole, we would see a core similar to the one shown in **Figure 2**, which illustrates a solid, spherical, rotating, incandescent body similar to the Earth´s inner core. **Figure 2** shows a section of the Earth´s core as seen from the Arctic pole, showing two layers of electric charge in different, concentric positions. The outermost layer contains negative ions, which are separated by heat. The other layer, which is composed of positive charges, has a smaller radius than the other layer. The existence of electric currents is not assumed; that is, the charges are fixed to the body, but rotate with it in a counterclockwise direction. A magnetic field is generated within the inner core, which is directed towards the Arctic, centered on the sphere and aligned with its axis of rotation, as will be demonstrated below.

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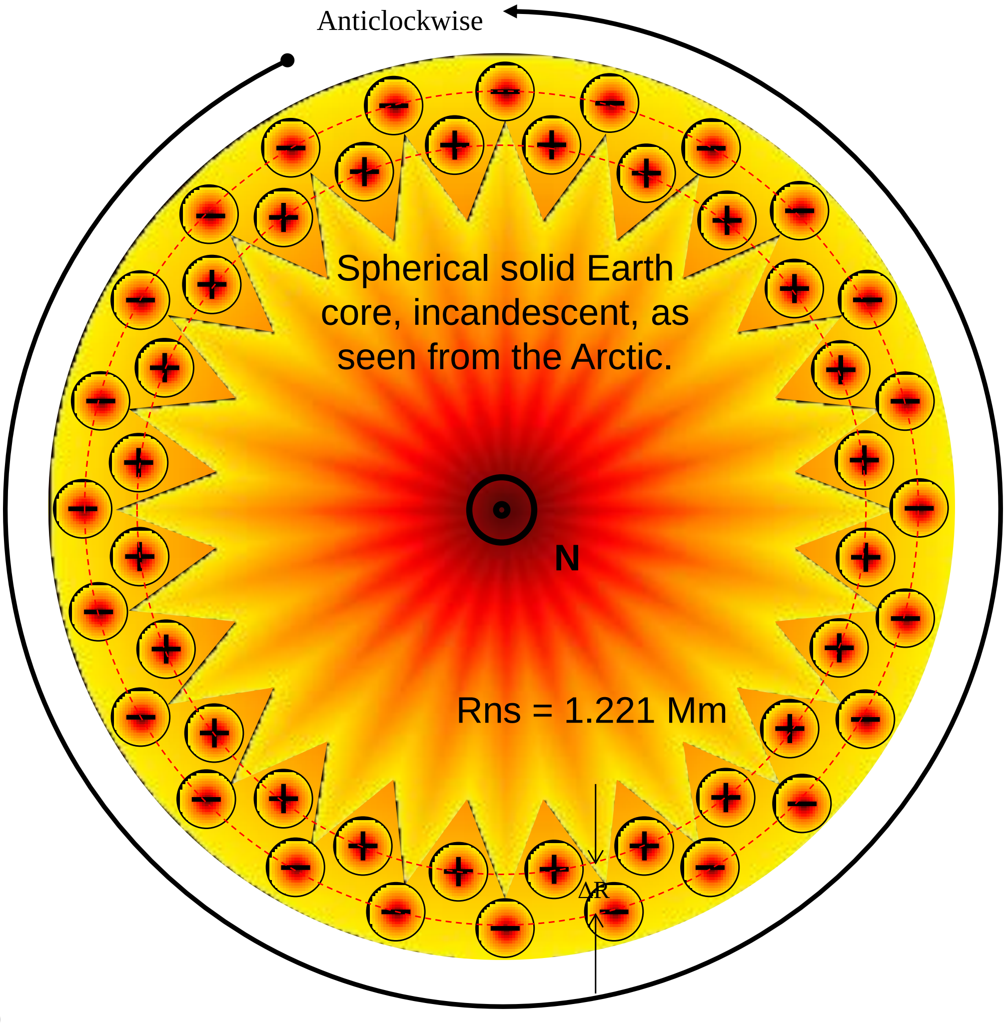

FIGURE 2 – EARTH´S SOLID INNER CORE SEEN FROM SPACE THROUGH THE ARCTIC

According to the theory of electromagnetism, it can be inferred that an infinitesimal ring located on the surface of a sphere of radius "R" containing electric charges "Q", either positive or negative, and rotating "ω", will be capable of producing a magnetic field at a distance "P" from the centre of the sphere on the axis of the same, of magnitude "B" as Eq. 1.

In this case, the B field is positive, according to the right-hand rule, in the Arctic direction, as r^- is greater than r^+.

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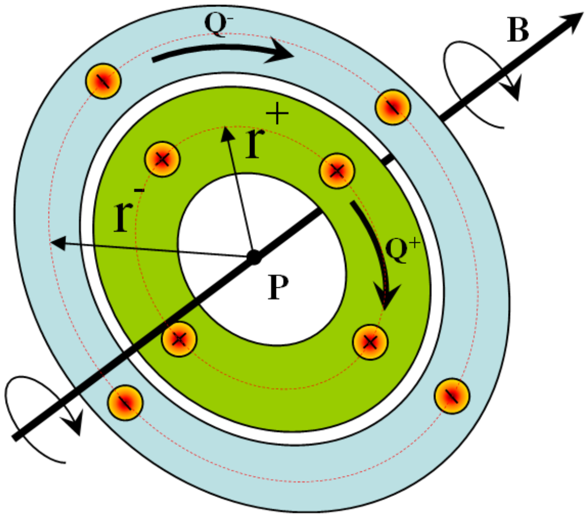
$$B = \mu_0 \cdot \frac{Q \cdot \omega}{2} \cdot \left[\frac{1}{r^+} - \frac{1}{r^-} \right] [T]$$ **Eq. 1**



Where :
$\mu_0 = 400 \cdot \pi$ [nH/m];
Q = Electric charge [C];
ω = Angular velocity = $2 \cdot \pi \cdot$ rps [1/s];
r^+ = Orbit radius of positive charges [m];
r^- = Orbit radius of negative charges [m].

FIGURE 3 – INFINITESIMAL RINGS OF ELECTRICAL CHARGES IN ROTATIONAL MOTION.

Since there are two charge rings, one with negative charges with radius r^- and the other with positive charges, with radius r^+, the field intensity in the centre of these rings, P, would result in "B", according to the eq. 1.

The direction of this magnetic field, or the magnetic induction path, follows the right-hand rule [3].

Richardson-Dushman discovered that there are electric charges and ions on an incandescent surface. This cloud is generated by thermionic emissions. According to Richardson-Dushman [4], it is possible to determine the maximum saturation current Is by using Eq. 2.

$$Is = A \cdot T^2 \cdot Exp\left[\frac{e \cdot \phi}{k \cdot T}\right] [A/m^2], \; where:$$ **Eq. 2**

A = Thermionic emission constant = 1200 kA/m² for pure metals;
T = Absolute temperature [K];
e = Charge of the electron = $-160 \cdot 10^{-21}$ [C];
ϕ = Metal work function [eV];
k = Boltzmann constant = $138 \cdot 10^{-25}$ [J/K].

Using an appropriate factor to convert the maximum current density to the maximum surface electrical charge density results in the following: Qs = Is . ChC, where, ChC = Electric charge converter [C/A];

In an infinitesimal disk of a rotating solid sphere, of width dr, there would be rotating electrical charges, corresponding to a surface current, Ii as follows:

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$$I_i = 2 \cdot \pi \cdot a_i \cdot I_s \cdot \text{ChC} \cdot \omega \cdot dr \qquad \text{Eq.3}$$

Considering the average pole diameter as:

$$Dp = 12.71\,Mm$$

$$c_i = (i-1) \cdot RnIp / Nmx$$

$$a_i = \sqrt{RnIp^2 - c_i^2}$$

The average radius of Earth, or point P, is the location of the Bp field. **Figure 4** shows more details.

The integration was divided into two series, one above the centre of the sphere (up) and the other below (dn).

$$b_{iup} = P - c_i$$

RmT = Dp/2 = Mean polar radius of the Earth.

$$b_{iup} = RmT - c_i$$

$$b_{idn} = P + c_i$$

$$b_{idn} = RmT + c_i$$

$$Bp_{up} = \frac{\mu_o}{2} \cdot \frac{I_i \cdot a_i^2}{\left(a_i^2 + b_{iup}^2\right)^{3/2}} \quad \text{and} \quad Bp_{dn} = \frac{\mu_o}{2} \cdot \frac{I_i \cdot a_i^2}{\left(a_i^2 + b_{idn}^2\right)^{3/2}}$$

$$B^+ = \mu_o \cdot \pi \cdot I_s \cdot \omega \cdot \int_{-Rns}^{Rns} \left[\frac{a_i^3}{\left(a_i^2 + b_i^2\right)^{3/2}} \right] \cdot dr \qquad \text{Eq. 4}$$

$$B^- = -\mu_o \cdot \pi \cdot I_s \cdot \omega \cdot \int_{-(Rns+\Delta R)}^{(Rns+\Delta R)} \left[\frac{a_i^3}{\left(a_i^2 + b_i^2\right)^{3/2}} \right] \cdot dr \qquad \text{Eq. 5}$$

After Thomas Edison [5] discovered that there were electron clouds around an incandescent body with thermionic emission, Richardson-Dushman [4] developed a correlation between the temperature and the maximum current density that could be extracted from the solid body. But it wasn´t clear how far these clouds were from the body. What is certain, however, is that at low temperatures none of the electrons were removed, but they were very close, that is, with such a low separation distance that it was not possible to remove them through the application of electric fields.

It was assumed that, empirically, the distance between the positive and negative charges on the surface of the incandescent inner core is directly proportional to the temperature, and as a starting point, it is equal to:

$\Delta R = T\,[K] \cdot 10^{-6}, [m]$, where

ΔR = The difference between the radii of the negative and positive layers, shown in **Figure 2**, as already stated, was empirically considered a function of temperature.

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Hence, at higher temperatures, there will be a greater separation between the charges, whereas at zero temperatures, there will be no separation between the charges, and the generation of magnetism will remain constant in both directions, i.e. null. As

$$B_P = B^+ + B^-, [T]$$

The magnetic field at a distance of "P" from the centre of the sphere will be of magnitude "Bp", as summarized in **Figure 4**.

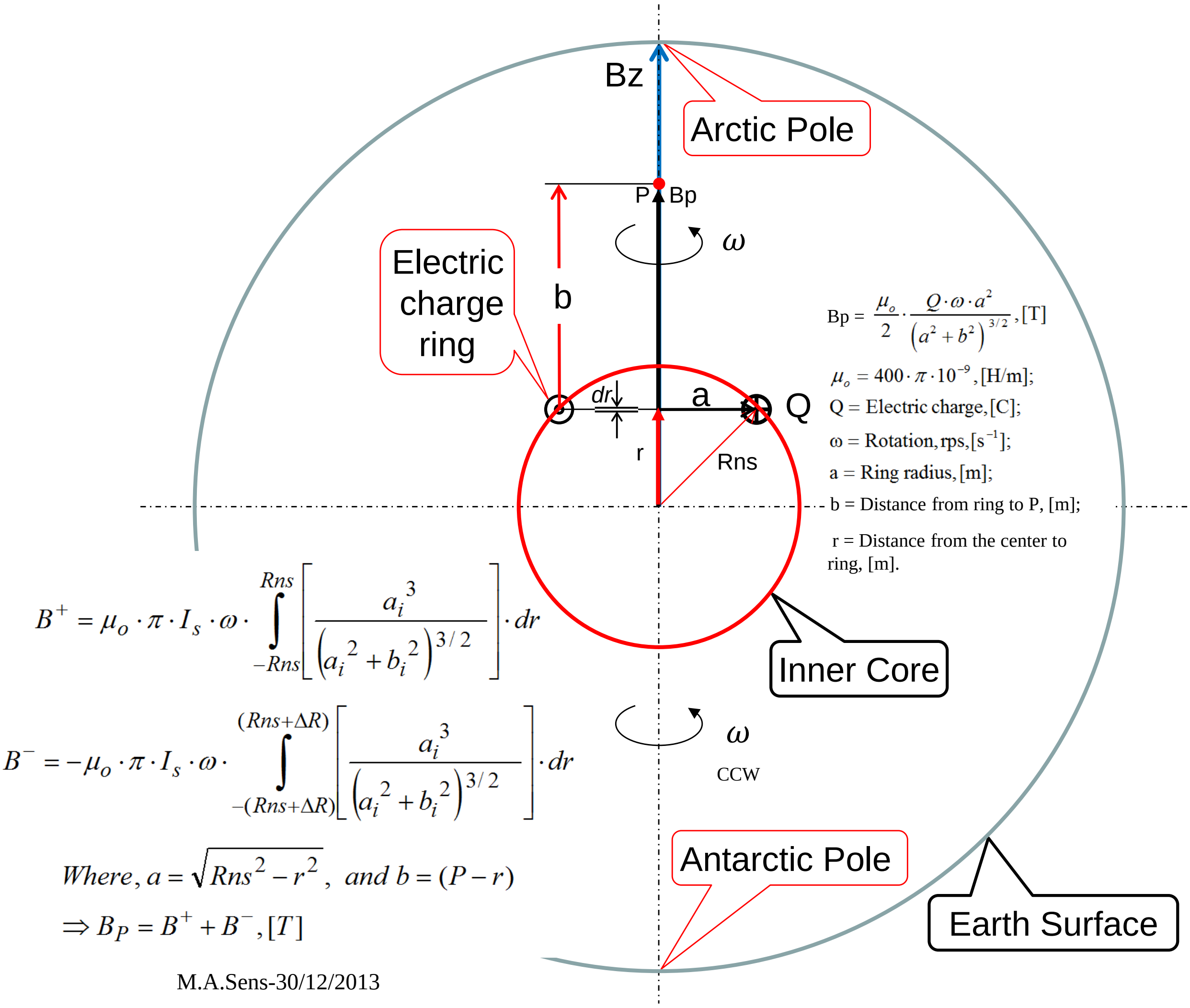

FIGURE 4 – THE COMPUTATION OF MAGNETIC INDUCTION AT A POINT P LOCATED ON THE AXIS OF ROTATION OF THE INNER CORE.

Based on these equations, it was possible to calculate the magnetic induction along the axis of rotation of the inner core, from the centre to the surface of the Earth, at the Arctic Pole, assuming the temperature to be 5000 °C on its surface. In this instance, in order for the magnetic field to attain the value described in the literature, of approximately 60 μT, successive interactions were necessary to attain the ChC constant of 9.137 C/A. The results are presented in **Figure 5**.

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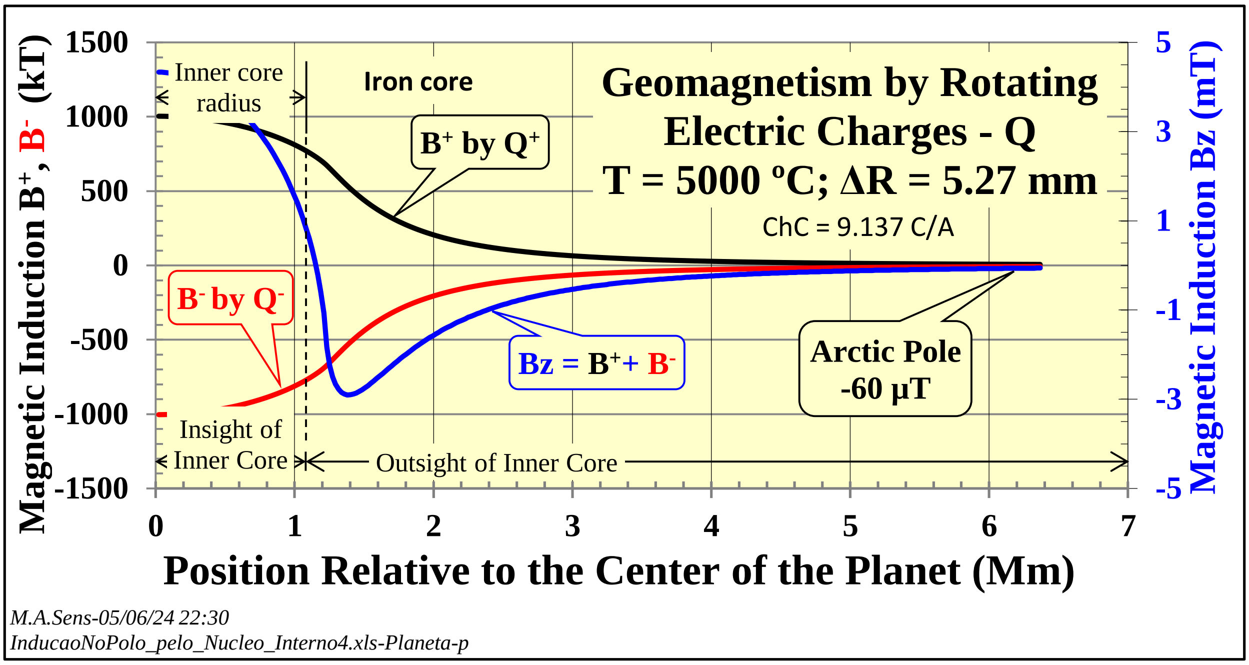

FIGURE 5 – THE MAGNETIC INDUCTION OBTAINED THROUGH MATHEMATICAL SIMULATIONS FOR THE INNER CORE AT 5000°C.

The magnetic induction along the axis of rotation of the inner core, from the centre to the surface of Earth, at the Arctic Pole, was calculated using the same equations, assuming a constant of ChC = 1.00 C/A. In this particular situation, in order for the magnetic field to attain a value of approximately 60 µT, successive interactions were required to attain a temperature of 6063 °C on its surface. The results are presented in **Figure 6**.

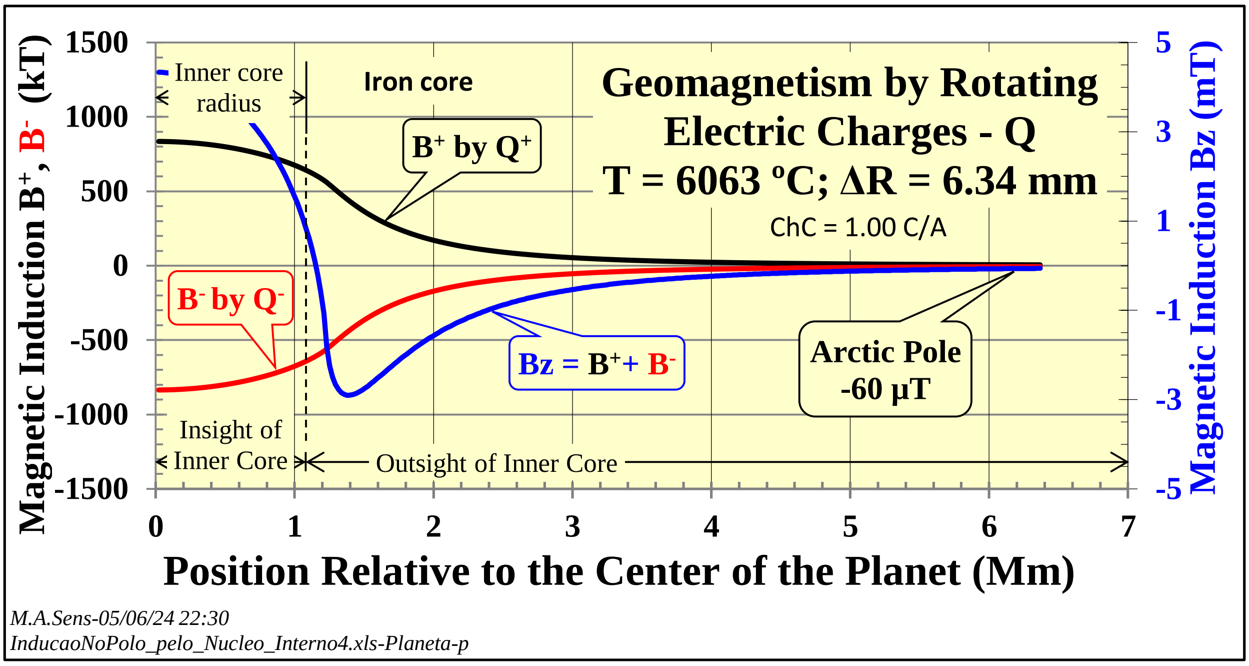

FIGURE 6 – THE MAGNETIC INDUCTION OBTAINED THROUGH MATHEMATICAL SIMULATIONS FOR THE INNER CORE AT 6063 °C

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5 Very Strong Hypothesis

The most comprehensive hypothesis to explain the origins and behaviours observed over the centuries on planet Earth is that the origin of geomagnetism is related to the rotation of the incandescent inner core. This explains the direction, the oscillations and temporal reductions, and, most mysteriously, the reversals.

According to the theory put forward by the author and demonstrated by the previous mathematical simulation, subject to experimental confirmation, magnetism would be generated by peripheral negative electric charges, spatially distributed on the spherical surface of the incandescent cup, and by positive electric charges, forming a substrate for the previous layer.

The layers were formed by the separation of charges due to the thermionic effect of the incandescent bodies. The hotter the object is, the more surface electric charges there are, Eq. 3, and the more it rotates, the more magnetism is generated outside the sphere in the direction of the left-hand rule, Eq. 4 and Eq. 5. The left-hand rule is shown in **Figure 16**.

Thus, from the simulations demonstrated, the Earth´s inner core rotates counter clockwise and generates magnetic fields in the direction of Antarctica, outwards. **Figure 7** illustrates this generation of magnetism in a three-dimensional representation, showing that the magnetic field has different directions, from the inside of the inner core to the Arctic and from the outside of the inner core to the Antarctic. The present circumstance is described as "Normal", as in today´s direction.

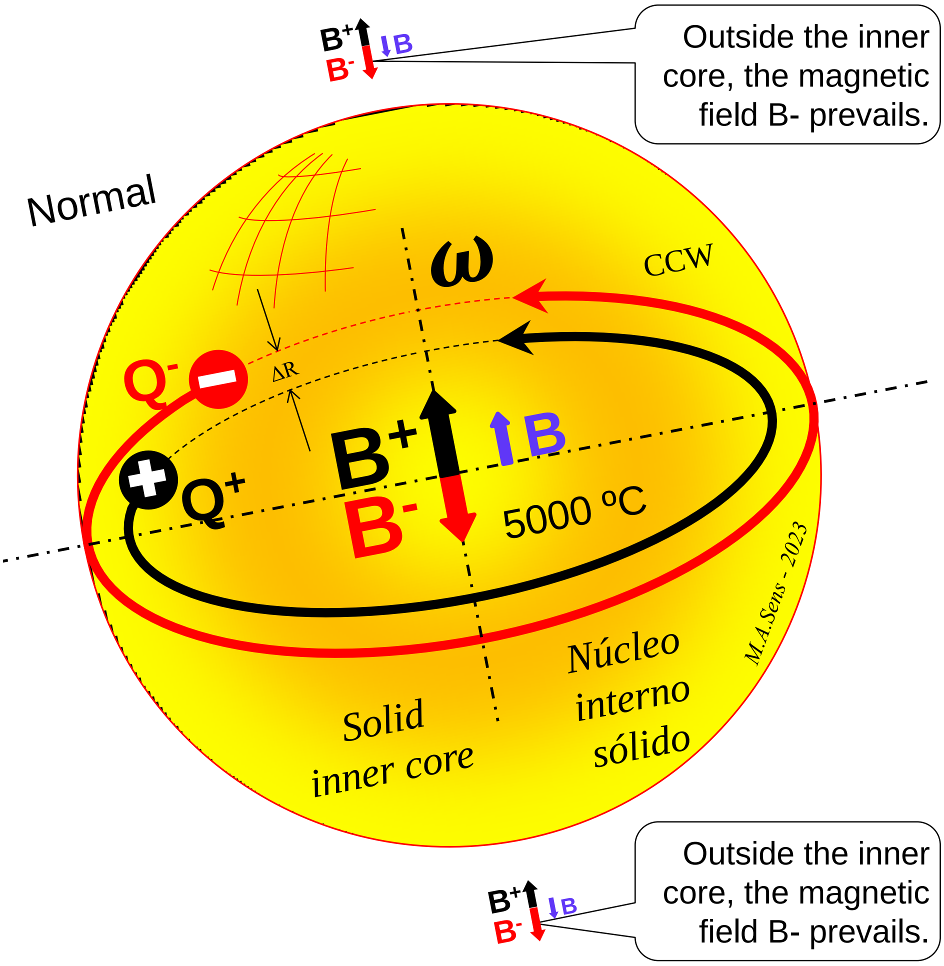

FIGURE 7 – GENERATION AND TODAY´S DIRECTION OF GEOMAGNETISM-NORMAL

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6 About Geomagnetic Reversals

The author proposes a theoretical explanation for the creation of a reverse geomagnetic field: the incandescent inner core reverses the rotation around its own axis. To achieve this, it is not necessary to reduce the rotation until it stops and starts in the opposite direction. It is enough for the axis of rotation to turn in the opposite direction to create reverse magnetism, maintaining the same rotation.

So, to have a reversal, the axis of rotation of the inner core only needs to tip in the opposite direction, without stopping or reducing the rotation of the core. In order to reverse the direction of this axis and tip it 180 degrees, it would be necessary to have a significant impact with the planet, such as from a large and swiftly moving asteroid. The axis may remain in other positions until it finds a reasonable equilibrium after a massive impact, as evidently, there will be numerous "brief" oscillations. Most likely, the Earth's core still has oscillations today because of the latest impacts from celestial bodies. These oscillations were transferred to the alignment of geomagnetism that has been seen for centuries.

In **Figure 8**, the axis of rotation, magnetic alignment, and rotation would look in the clockwise (CW) direction, so that the magnetism results in the opposite of "Normal."

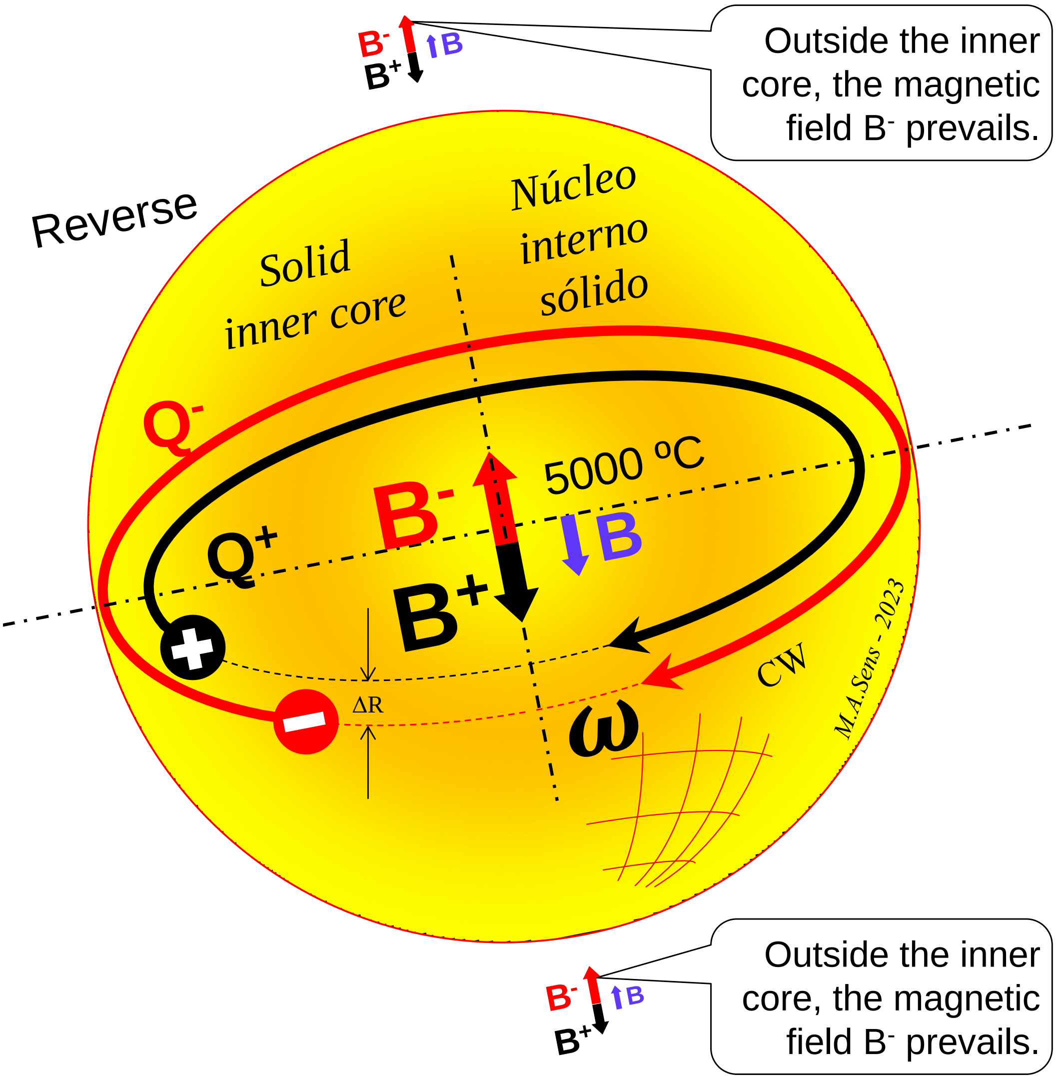

FIGURE 8 – GENERATION AND REVERSE DIRECTION OF GEOMAGNETISM

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It is important to highlight that, to generate magnetism, the existence of charge layers at different radii is necessary, with ΔR being extremely dependent on temperature. In a cold sphere, ΔR = 0, and, therefore, the generation of magnetism does not occur, as there would be two opposing fields of the same intensities.

Similar to the Earth, the planets, like celestial bodies, have, for some time since their origin, had an incandescent solid core floating in a liquid or pasty bath, called magma. Magma is a mineral mass that is in a state of fusion, incandescent, and located within celestial bodies. Its movements determine volcanic phenomena, and upon cooling, it crystallizes, resulting in the formation of igneous rocks. Such rocks record the magnetic alignment of the place and moment of formation, indefinitely and forever.

Thanks to records of magnetic alignment in volcanic rocks, it is currently known that the Earth has had different magnetic alignments, including poles aligned with the geographic equator, 90 degrees from the current alignment. Studies strongly suggest that many reversals of Earth´s magnetic field have occurred within the last 160 million years [6]. In this period, there were 135 reversals, and 68% of the time the alignment was "Normal", as it is now [1].

Due to the alignment of lunar magmatic rocks, it is known that the Moon once had its own magnetic field, and a compass is useless on this satellite today's.

For the reversals to occur, Planet Earth had to receive impacts of great magnitude from celestial cups and asteroids, which shook it, shaking the entire centre of the Earth [7], causing the internal solid core to topple. With this, the axis of rotation was reversed, without inversion or change in the rotation of the nucleus. The evidence of the occurrence of these impacts can be observed in the craters left on the Earth's surface [8], [9].

As illustrated by **Figure 9**, there is a correlation between impacts and magnetic reversals, as evidenced by craters.

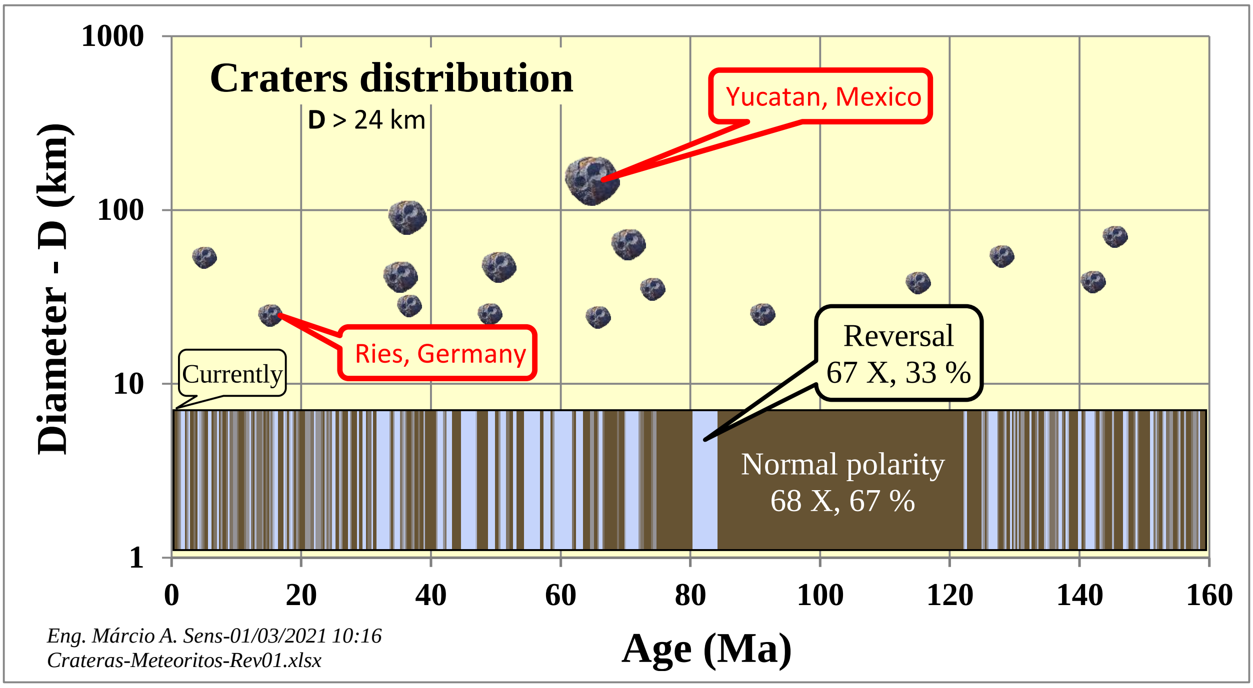

FIGURE 9 – CORRELATION OF IMPACTS, EVIDENCED BY CRATERS, WITH MAGNETIC REVERSALS

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7 Planetary Magnetism

As demonstrated by Sens [3], a solid, spherical, incandescent body in rotation generates a magnetic field outside the sphere, aligned with the axis of rotation and in the direction determined by the left hand. In other words, with the fingers aligned in the direction of rotation, the thumb indicates the direction of the magnetic field of the spherical generator, outside of it. Inside the spherical body, the magnetic field has the opposite direction.

This theory will then be applied to analyse and justify the presence or absence of magnetism in the major celestial bodies. What is the magnetic field of the primary bodies in our Solar System? Regarding the topic, it will be discussed below.

7.1 Mercury

Mercury is the first planet in proximity to the Sun. Mercury has a magnetic field of only 1.0% of that exhibited by Earth at the Equator. The inclination of the magnetic axis regarding the axis of rotation is unknown. The planet´s low magnetic field can be justified by its low rotation, which is only 1.7% of the Earth´s rotation, and the reduced diameter of the core, which is only 52% of the Earth´s core. Since Mercury has its own magnetic field, it is likely that this planet has an incandescent core.

Mercury is believed to have a large core. According to thermal calculations, it may have a 500 km thick solid lithosphere and the core may be partially molten if it contains heat sources. If this is not the case, the interior temperatures of the planet are consistently below the melting point of iron. The thermal evolution of Mercury is dominated by core separation and the high conductivity of iron [10].

The presence of a magnetic field [11], [12], coupled with a high mean density (5430 kg/m^3) and Cosmo chemical models, suggests a substantial Fe core.

Mercury has its own magnetic field, but it´s not as strong as Earth´s. Mercury has a core that is not cold, but incandescent if there is a magnetic field on it. Therefore, the magnetic field on Mercury is much smaller than that on Earth because Mercury has a smaller diameter and much less rotation, being only 0.017 rotations per Earth day, clockwise. The rotation of the nucleus is clockwise because the magnetic field is in the South-North direction of the geographic poles.

7.2 Venus

The second-closest planet to the Sun has a tiny magnetic field, but it´s not zero. The absence of a magnetic field is justified by the very low rotation, which is only 0.4% of the Earth´s rotation, as its core diameter is almost equal to the Earth´s core. Most likely, Venus has a solid core at temperatures much lower than those in the Earth´s core. This fact affects how strong the magnetic field is.

Venus is characterized as a planet that shares numerous similarities with Earth. The formation of the Venus Core is thought to have occurred within the first billion years following its emergence. At the present day, temperatures indicate a partially molten upper mantle overlain by a 100 km thick lithosphere and a molten Fe-Ni core in Venus. If temperature models are accurate, we can expect that Venus has similar tectonic processes to Earth´s [10].

If similar moments of inertia factors are assumed for Venus and Earth, it is estimated that Venus possesses a completely distinct Fe-Ni core with a radius of approximately 2,900 km [13].

7.3 Earth

Earth is the third planet closest to the Sun and exhibits an average magnetic field of 31 µT at the equator, with an inclination of approximately 11º between the magnetic axis and the Earth´s rotation axis. The inner core is an incandescent and dense ball composed primarily of iron. The radius is approximately 1,220 kilometres. The inner core temperature is approximately 5,200°C. The mathematical simulations of

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the model proposed by Sens, 2023[3] indicate that the magnetic field at the equator results in approximately 50% of the average magnetic field at the poles, of 60 µT, towards the geographic South Pole and that the incandescent core rotates counter clockwise, in the same sense as the Planet.

7.4 Mars

Mars is the fourth closest planet to the Sun, and it has a rotation equivalent to Earth and a practically zero magnetic field. The fact that Mars doesn´t have a magnetic field can only be explained by the temperature of its core, which must be much lower than the Earth´s solid core. Magnetic fields in random directions have been observed in Martian rock surfaces.

7.5 Jupiter

Jupiter has an enormous magnetic field, equivalent to 1380% of the Earth´s magnetic field at the equator. Jupiter rotates very fast, almost 240% faster than Earth´s rotation, and its core is very big, about 1500% bigger than Earth´s core. But we don´t know for sure how big it really is. If Jupiter has an incandescent core in the proportions indicated in the literature and at the same temperature as the Earth´s core, it should exhibit a magnetic field in the Arctic of 5.586 mT, according to simulations. For there to be a magnetic induction of the order of 850 µT, approximately, at Jupiter´s arctic pole, the temperature of the solid core would have to be lower than that of the Earth´s core, or 4275 °C, according to the simulation carried out. Or, the diameter of the Jovian nucleus must be smaller than the diameter indicated in the available literature.

Since the Jovian magnetic field is currently in the direction of the geographic North Pole, the rotation of the incandescent core must be in a clockwise direction, opposite that of the planet. Jupiter´s rotation around its axis, counter clockwise, is 0.4135 Earth days, or 2.4 rpd. The high rotation of Jupiter would already result in a stronger magnetic field than the one observed on Earth, 428 µT at the equator.

7.5.1 IO, One of Jupiter´s Satellites

The Jupiter´s Moon, IO, which is approximately equal in size to the Earth´s Moon, lacks its own magnetism, despite possessing incandescent materials, due to a simple reason: low rotation around its axis, as documented by the author on February 12, 2024. The image of Io is shown in **Figure 10**.

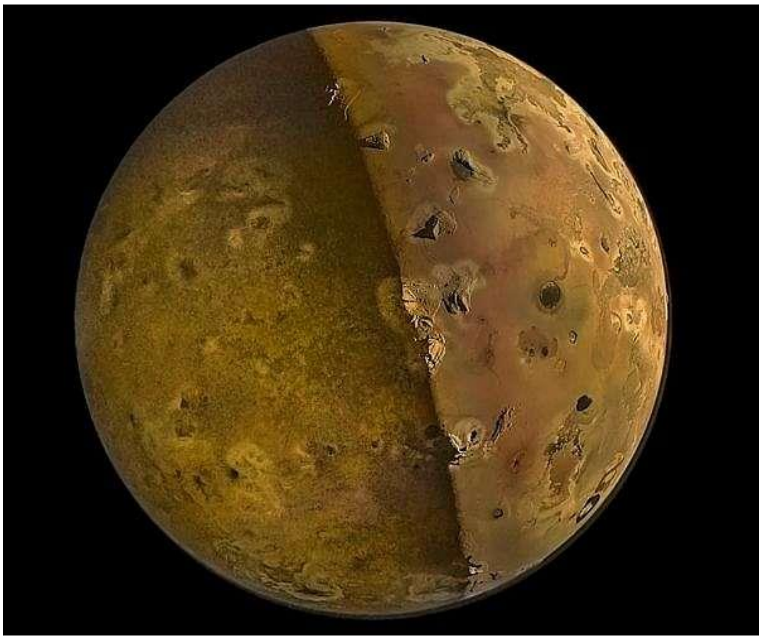

FIGURE 10 – JUPITER´S SATELLITE, IO [14]

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According to NASA [14], Jupiter´s Io generates energy and noise, but no magnetic field. Io rotates at the same speed as it revolves around Jupiter, so it always has the same face as Jupiter. According to Britannica [15], its orbit is nearly circular and exhibits a slight inclination of 0.04° in relation to Jupiter´s equatorial plane. With a radius of approximately 422,000 km, Io has irregular magnetic fields. Io is different from Earth because it doesn´t have a magnetic field like Earth does. Instead, it is enveloped by Jupiter´s enormous magnetosphere. Aljona Blocker [16] said that if Io were removed from Jupiter´s magnetosphere and placed in empty space, it would have no magnetic field.

7.6 Saturn

Saturn is the sixth planet from the Sun and exhibits a magnetic field smaller than that of Earth, being 21.2 µT at the equator. Saturn´s diameter is much larger than Earth´s, almost ten times, and its rotation is 2.3 rpd. This small magnetic field is justified for two possible reasons: the incandescent core is smaller than Earth´s, or the temperature is lower than the Earth´s core. But if the magnetic field is directed towards the North Pole, then the rotation of the core will be opposite the rotation of the planet, that is, it must be clockwise.

The distribution of Saturn´s magnetic field suggests that this planet has an incandescent core well centred with it and with rotation axes perfectly aligned, with minimal inclination.

7.7 Uranus

Uranus is the seventh planet from the Sun and exhibits a magnetic field smaller than that of Earth, being only 23.0 µT at the equator. The diameter of Uranus is four times that of our planet. Also, Uranus rotates faster than Earth by 1.40 times per Earth´s day. Uranus must have a smaller incandescent core or a lower temperature in order to have a smaller magnetic field than that exhibited by Earth. The biggest curiosity about this Planet is that the core is off-centre with the planet and has an inclination of almost 60 degrees between the rotation axes.

7.8 Neptune

Neptune is the eighth and last planet from the Sun and also exhibits a magnetic field smaller than that of Earth, being just 14.0 µT at the equator. This planet is also larger than Earth by almost 3.9 times and rotates 50% more than Earth, making 1.5 rpd. Likewise, to have a lower magnetic field than the Earth´s, it must have a smaller core and a lower temperature than the Earth´s core. Another anomaly, compared to the others, is that the core of this planet is completely off-centre, rotating clockwise—that is, rotating opposite to the planet.

8 A Solid, Incandescent, and Rotating Body can Create Magnetism – Experimental

A fresh hypothesis for the origin of geomagnetism, distinct from traditional theories and the self-excited geodynamo conjecture, is demonstrated above, both theoretically and mathematically. However, the validation lacks experimental evidence, never obtained by traditional hypotheses already raised to justify the nature of geomagnetism.

An experimental approach is proposed to test the hypothesis that a rotating and incandescent solid body is capable or incapable of generating magnetic fields, and under what conditions. A mathematical analysis was used to try to find materials and conditions that could be used with low resources. The subsequent materials were identified for the purpose of the experiment, namely steel, graphite, and tungsten. The speeds considered were 1,600 to 24,000 rpm. The safe temperatures were between 1350 °C for steel and 2500 °C for graphite. The size of the rotating part was observed to prevent too much heat transfer to the rotating machine. The solid body will have a diameter of 30 to 75 millimetres and a length of 500 millimetres. **Figure 11** shows the proposed test circuit as a schematic.

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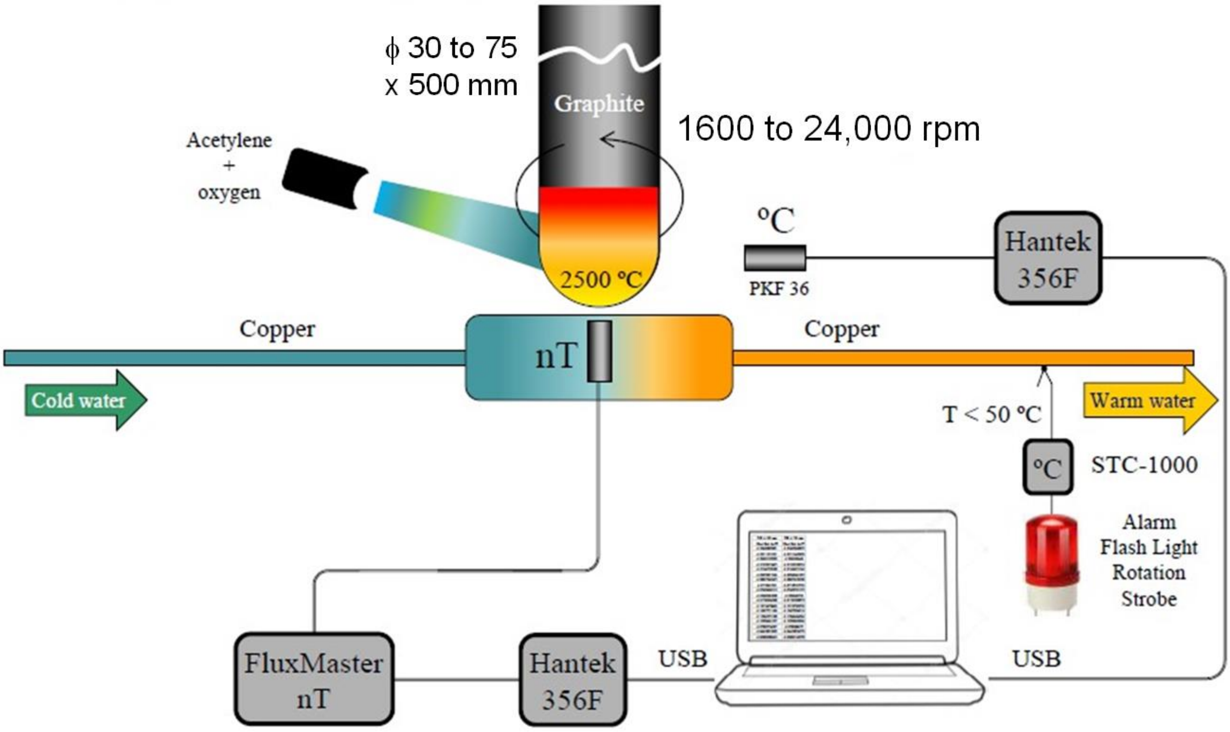

FIGURE 11 - EXPERIMENTAL ARRANGEMENT PROPOSED TO CREATE MAGNETISM BY ROTATING AN INCANDESCENT SOLID BODY

The anticipated magnetic induction is depicted in **Figure 12**, not precisely in absolute values, but mainly in relative quantities, for temperatures ranging from 2000 to 2500 °C in graphite with a spherical diameter of 50 mm, at a minimum speed of 1600 rpm.

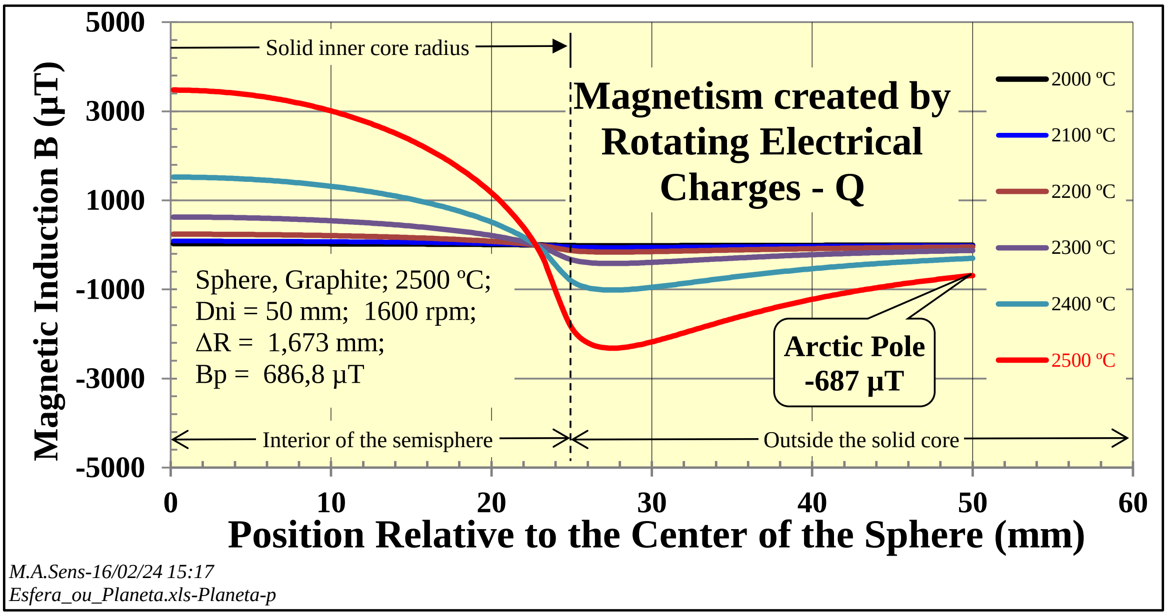

FIGURE 12 - EXPECTED RESULTS FOR ROTATING INCANDESCENT GRAPHITE

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A double coil of copper wires measuring 80 x 80 mm was made to look like an incandescent graphite rotating cylinder. The **Figure 13** illustrates how the coil's magnetic field fluctuated along its horizontal axis, measured at its canter, at intervals of 15 µm.

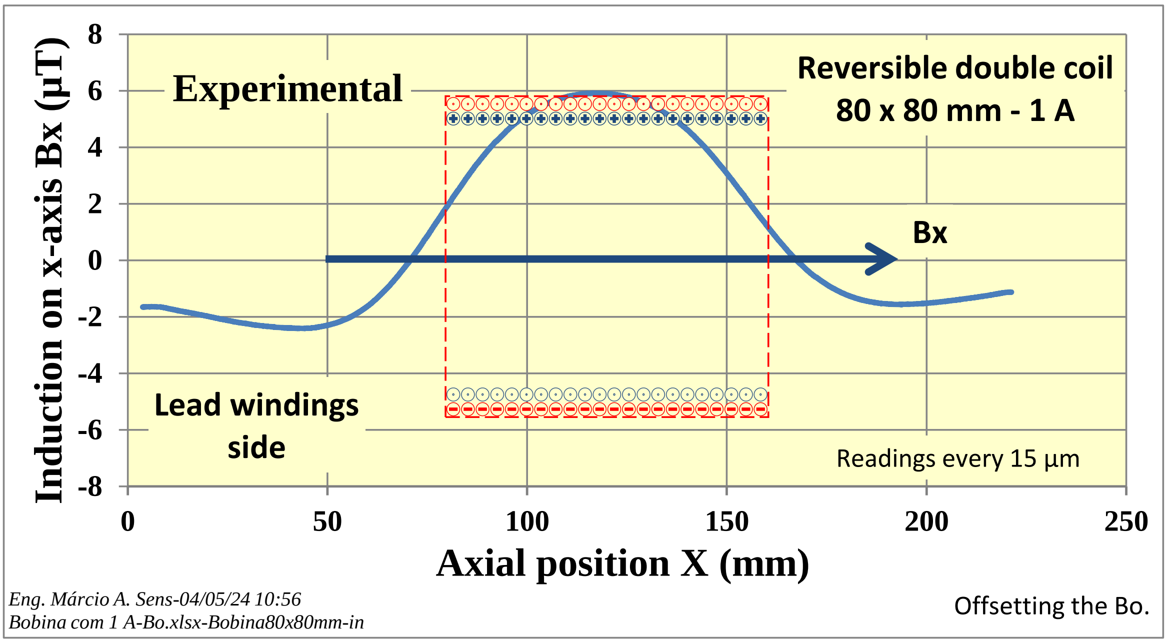

FIGURE 13 - MAGNETISM MEASURED AT THE CENTRE OF THE COIL

9 Conclusions

It required a considerable amount of time for science to accurately determine the direction of rotation of the Earth´s core. It has been found that the core of the earth, which was with a slight positive acceleration, is now with a negative acceleration. This was achieved with great effort [17]. Several newspapers have incorrectly translated this scientific news, confusing speed with acceleration. Although the acceleration is negative and is reversed from what it was before, it does not mean that the rotation has reversed, but only that the rotation of the nucleus is slightly decreasing.

If identifying the direction of rotation of the Earth´s core was a difficult and complex task, imagine what it would be like to identify the direction of rotation of the cores of other satellites and celestial bodies. The existence of an incandescent solid core on other celestial bodies will be extremely difficult to confirm.

Nevertheless, in the event that the hypothesis formulated here, that magnetism is generated by the incandescent solid core, is substantiated experimentally, and given that the distribution of the external magnetic field to celestial bodies is much more easily ascertained in the Solar System, the task becomes simplified. If the body has its own magnetic field, then it has an incandescent solid core. The direction of rotation of the incandescent inner core can be identified using the left-hand rule, knowing the direction of the magnetic field. The Moon lacks an incandescent core, which is why the celestial body doesn´t have an incandescent core.

The inner, solid, and incandescent cores of the planets Jupiter and Saturn possess rotation axes with inclinations of 9.6 degrees and zero degrees, respectively, and, surprisingly, exhibit opposite directions to the rotation of their respective planets. What is the basis for the evidence? These planets have reversed their magnetism, which is caused by their core rotating.

It is not known for certain whether the rotation of the planets´ cores is of the same order as their rotation, like on Earth. Nevertheless, as rotation has a direct impact on the generation of magnetism, as per the hypothesis presented here, the **Figure 14** depicts the rotation of the principal bodies in the Solar System in terms of revolutions per Earth´s day - rpd.

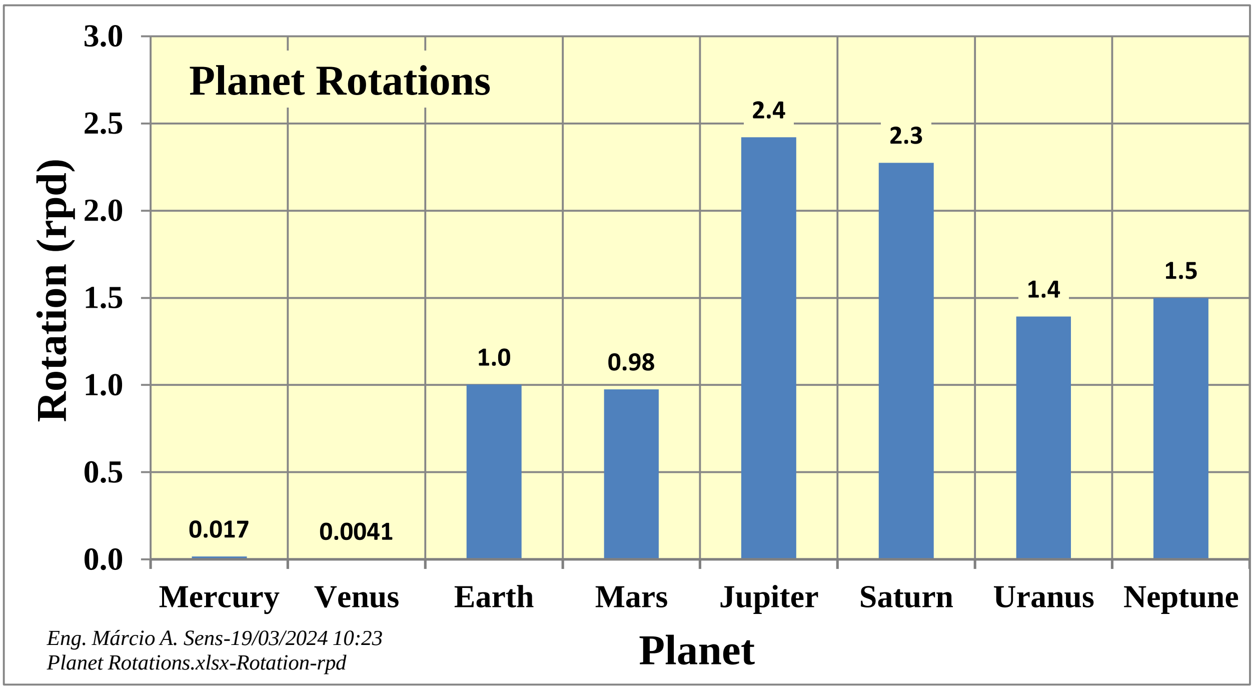

FIGURE 14 – THE PLANETARY ROTATION IN OUR SOLAR SYSTEM.

To conclude, using the new way of generating magnetism presented, it was possible to add a lot of useful information to a very well-elaborated survey of the planets of the Solar System, only those that exhibit some magnetism of their own. It was now possible to identify the direction of rotation of the cores and the positioning of the cores of the different satellites. This task is extremely difficult to this day. Several technical articles were published intending to publicize and record the authorship of this still-unexplored method of generating magnetism, including an experimental arrangement capable of being conducted by thousands of laboratories on this Planet [18]. The **Figure 15** shows the original survey, with additions of the rotation directions in cw = clockwise, or ccw = counter clockwise, in addition to the positioning of the incandescent core. Although Mercury has a weak magnetic field, which has already been mapped, it is not included in this survey.

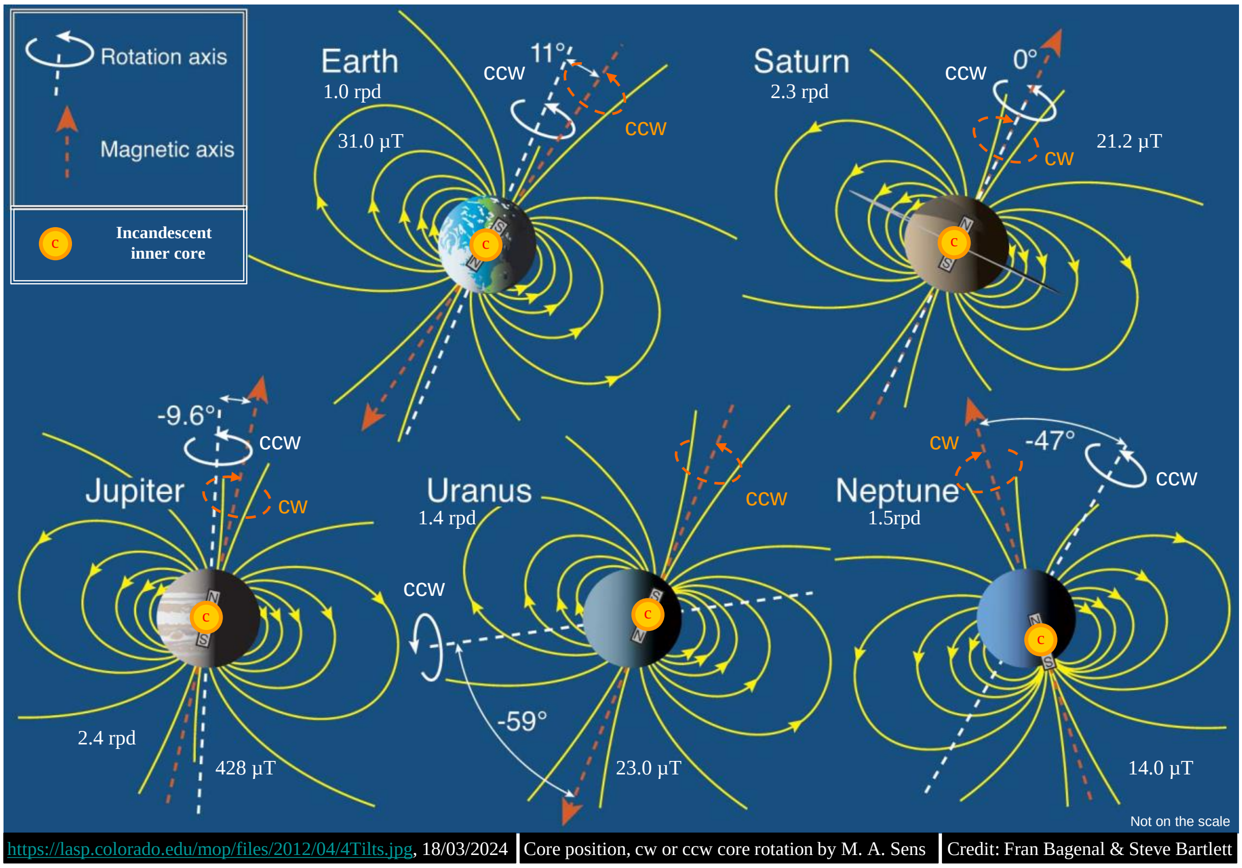

FIGURE 15 – MAGNETISM AND ROTATION OF THE CORES OF PLANETS

The left-hand fingers point in the direction of rotation of the incandescent inner core, whereas the left thumb points in the direction of the magnetic field generated by the rotation, as depicted in the **Figure 16**.

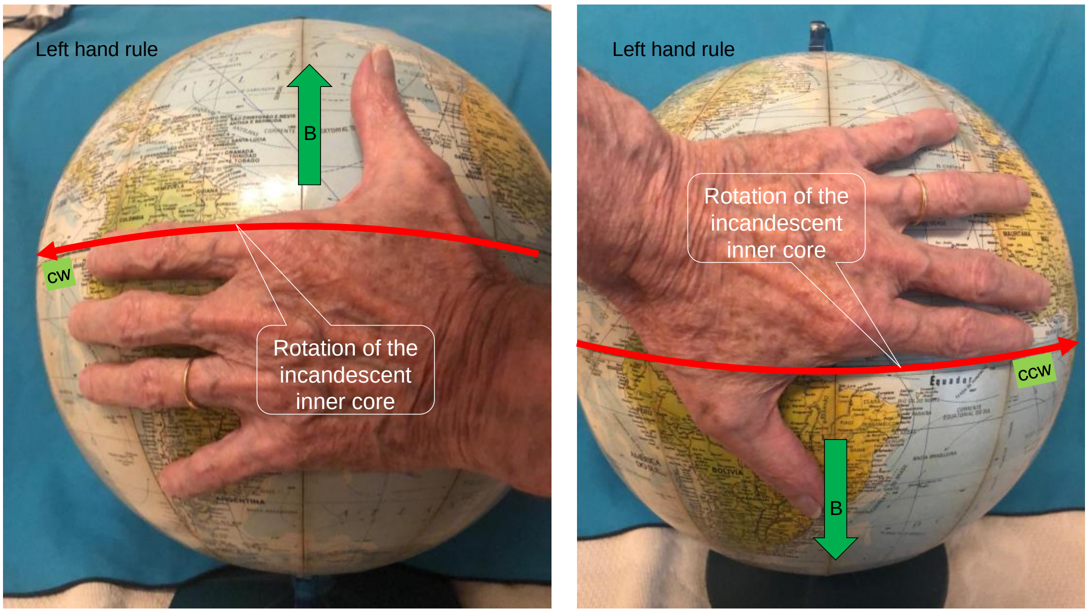

FIGURE 16 – THE LEFT HAND RULE

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M.A.Sens:09-09-2024

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Prof. M. A. Sens has a technical background in Electro mechanics, Electrical Engineering, Electronics and Industrial Safety. He has experience in the areas of Thermo-electromechanical Engineering and Safety Engineering, working mainly in experimental investigations related to electrical conductors, superconductors, dielectrics and magnetic materials; in addition to performing and teaching complex and precision electrical and magnetic measurements, including instrumentation calibration. Consultant and technical expert in forensic analysis, in Brazil and abroad. He has accumulated experience in industrial experimental activities, related to the Electrical Sector, since July 1969. He has worked as a professor since 1975 and currently teaches at the Fluminense Federal University – UFF, in the Electrical Power Engineering course

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