New Magnetosphere for the Earth In Future

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Abstract : All of us know the earth magnetic field come to be less and this problem can be a serious problem in future but now we find other problems that can destroy our planet life or in minimum state can damage it such as FTE theory , solar activities , reversing magnetic poles, increasing speed of reversing that last reverse, reducing magnetic strength ,finding leaks in magnetosphere ,etc.

some of these reasons will be factors for increasing the solar energy that hit to the Earth and perhaps changing in our life and conditions of the Earth .

In this paper , I try to show a way to against to these problems and reduce their damages to the Earth perhaps The Earth will repair himself but this repair need many time that humans could not be wait.

In the past time magnetic field was reversed but now we are against to the other problems that can increase the influence of reversing magnetic field for the Earth and all these events can be a separated problem for us, these problem may be can not destroyed humans life but can be cause of several problems that occur for our healthy and our technology in space.

This way is building a system that produce a new magnetic field that will be in one way with old magnetic field this system will construe by superconductors and a metal that is not dipole.

This paper explain all the problems in addition to the way of repair their damages on the Earth and show the suitable shape of system that can help us for future programs .

Key-Words: Environment Changing , FTE Theory , Gadolinium Material, Reversing Magnetic Poles.

I.   INTRODUCTION

THE importance of the Earth's magnetic field for live has discovered in this century, Continuous measurements of the Earth's magnetic field have now been taken for over a century and a half from observatories on the surface of the Earth and for about 3 decades from spacecraft above the surface of the Earth. These data have been supplemented with less precise data based on inferred values of the magnetic field deduced from remnant magnetic fields in rocks, pottery, and similar objects that can become magnetized as they cool. all known planets have strong or weak magnetic field that protect planet from cosmic rays and ionization winds.

Earth like all other planets has magnetic field that its strength is normal but in future our field will not simple , it will change and perhaps turn into the different thing.

We are sure changing the magnetic field in future is cause of lowering its strength and this subject is an

alert for our life on the Earth so finding a suitable way to face this problem is more necessary .

In paper I try to show a simple way to against this subject in our future.

For sure , using magnetic technology on create magnetic field by superconductor materials is the best way.

II.   PROBLEM FORMULATION

1 DANGERS ON THE EARTH

A . *solar wind*

In a period of time(25 days) some acts happening in Sun create a magnetic field which this field generates force on high energy charges and radioactivity 's particles which send these particles to the earth , these particles hit to the Earth's magnetic field .

Solar wind is a flow of atomic particles such as protons , electrons and basically ionized hydrogen .

When these particles hit to the magnetosphere , between them and magnetic field create a force which result of these reactions is aurora , according to the amount of numbers of aurora and strength of it , can find the strength of solar wind.

But this flow transfer so energy from Sun to the Earth. Earth without this field will be a burnt planet

B . *FTE theory*

FTE is transferring magnetic flux between Sun and Earth. It's called a flux transfer event or FTE.

 Researchers have long known that the Earth and sun must be connected. Earth's magnetosphere is filled with particles from the sun that arrive via the solar wind and penetrate the planet's magnetic defenses. They enter by following magnetic field lines that can be traced from terra firma all the way back to the sun's atmosphere.

Active FTEs are magnetic cylinders that allow particles to flow through rather easily; they are important conduits of energy for Earth's magnetosphere. Passive FTEs are magnetic

cylinders that offer more resistance; their internal structure does not admit such an easy flow of particles and fields.

This transfer is with transferring more energy from Sun to the Earth .

According to this theory , some times a magnetic domain created between Sun and Earth , so a high energy current come from Sun to the Earth . this transfer create a domain of energy , this energy could create a danger to the earth. If Earth's magnetic field being less this transfer could harm the Earth and its life.

Transferring this high energy cause of being less strength of magnetic field means if this flow with high energy charges hit the Earth's magnetic field , particles flatten our magnetic field more and could come into the magnetic field that this field could not face with these particles.

But we have another question and that is why these portals form every 8 minute?

The answer of this question could help us to program our problems correctly .

C . *reversing the Earth's magnetic field*

Earth has a magnetic field that create by rotation of its liquid iron core , this rotation create magnetic field that its NMP (North Magnetic Pole) is in south pole and SMP(South Magnetic Pole) is in north pole of the Earth means the magnetic pole that is in the northern hemisphere is a south pole. It attracts the north pole of a magnet. In earlier times the pole in the northern hemisphere has been a north pole.

 This structure of poles was not always in this shape , several thousands years ago magnetic field was not similar to our magnetic field .

Researching on magnetic field of volcanic rocks show in several thousands years ago NMP was in north pole and SMP was in south pole , also if their magnetic field measured in during of several hundred years after began to reverse of pole magnetic field of these stone come to be less.

These results show in during of reversing magnetic poles magnetic field being less step by step till change of poles goes to completion ,also the Earth's magnetic field dipole component decrease substantially during a reversal to values that range from 10% to 25% of the pre-reversal strength and this values are so less for our Earth in future.

When magnetic poles reversed completely , Earth's magnetic field being more like several hundred years ago.

This reversing needs to several hundred years and this time is more for a frail magnetic field protecting Earth from solar winds for example; 60 million years ago reversals occurred about once every 500,000 years, whereas 10 million years ago reversals occurred 3 times as often, about every 150,000 years [Barton, 1989].

Now period of reversing magnetic field was started and during of several decades decreasing of magnetic field's strength appear in our life , if this happen will occur in our life we will see aurora in our countries [reason of create aurora in north

pole is magnetic field frail in SMP and if magnetic field will be less in all parts of it , see aurora in each country is so normal].

The important problem on revering magnetic field is sense of Earth's magnetic field and Solar magnetic field that will be aligned , this happen cause increase the amount of danger ions that come to the Earth.

Fig.1:in Fig.1 we can see the structure of the Earth's magnetic field magnitude surrounding active place on the Earth's surface .
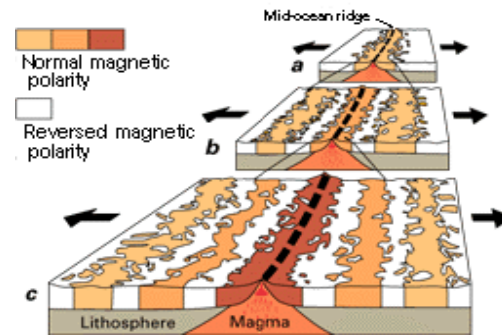
Above: Magnetic stripes around mid-ocean show reversing!

In Fig1 parts that are away from surrounding of magma activities have more choice in magnetic field and its magnitude come to be less too, magnetic field around the magnetic source(magma from the centre of Earth)is calm down, so we able to show choice in magnitude of the magnetic field of Earth .
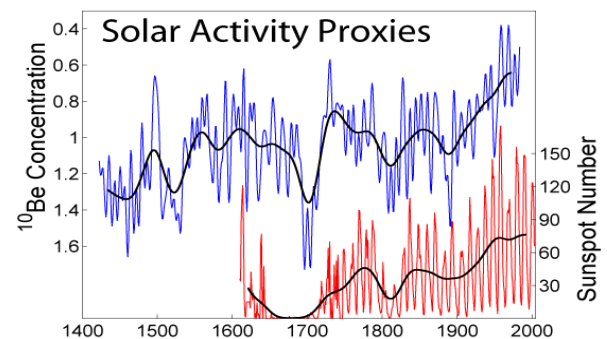
In addition to above texts, today it is about 10 percent weaker than it was when German mathematician Carl Friedrich Gauss started keeping tabs on it in 1845.

 D. *solar activities have been more*

This subject not proportion to the Earth this is up to Sun.

According to this graph :

Fig.2:this Fig shows changes in sunspot numbers according to satellites data.

   We can see solar activities in 2000 was more and find graph's slope and find size of solar activities in future.

Increasing solar activities and Sunspot number could be a reason for increasing solar winds and their powers.

Also according to fig2 , increasing the solar activities is related to increase sunspot on Sun and we know by increasing sunspot magnetic field of sun will powerful and the FTE phenomena occur more that every time.

Of course these consumes are not acceptable every time because the solar activities are not predictable.

Fig.3:this Fig shows the sunspot cycle and magnetic storm in a cycle , therefore we can use it in our explanations.
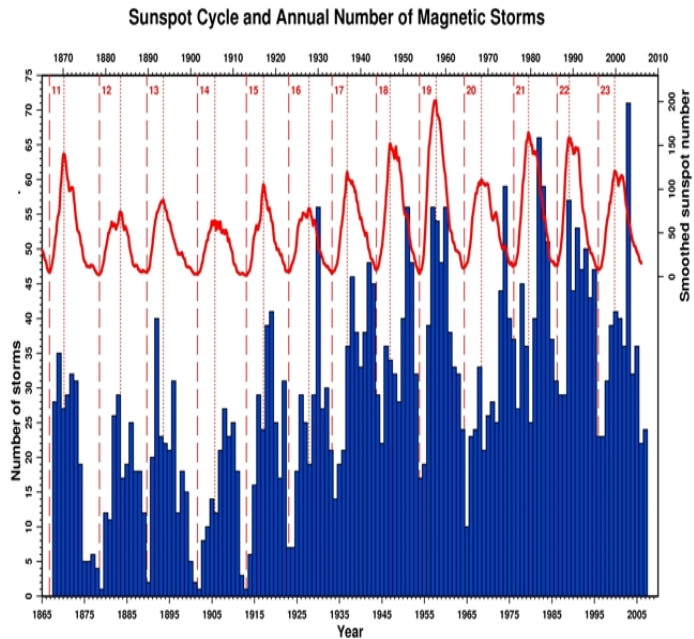
Now according to Fig3 we can see the sunspot cycle and magnetic storms from past until present time , this cycle is regular and repeat after a complete period of time. Also we can see in Fig3 number of sunspot and magnetic storms have direct communication with each other, this changing create a new problem for us (according to 2.1.2), when number of sunspot increase the strength of magnetic storm from sun increase .

Increasing the number of sunspots in this period is that time which the leak of the Earth's magnetic field is in maxima of itself , this is so dangerous for earth that these happens will occur in one time period!.

Also we can predict in 2020 the number of sunspot on the solar will be in minima amount these cycle help us to program a bout new maxima cycle.

But this factor is not always true , anticipating solar activities is more difficult for us and influence of the solar activities in this era is few and can ignore some of them.

Increasing solar activities in future(that time which the magnitude of magnetic field will less) will so dangerous for us that it can be reason to destroy our life but anytime do not ignore the Solar activities every time has this process and any time was not dangerous for our life but all problems occur in a time.

E . *holes in magnetosphere*

 NASA's five THEMIS spacecraft have discovered a breach in Earth's magnetic field ten times larger than anything previously thought to exist. Solar wind can flow in through the opening to "load up" the magnetosphere for powerful geomagnetic storms. The leaks are in an unexpected location, let in solar particles in faster than expected and the whole interaction works in a manner.

10^{27} particles per second were flowing into the magnetosphere—that's a 1 followed by 27 zeros. This kind of influx is an order of magnitude greater than what researcher thought was possible**.**

our magnetic field is a leaky shield and the number of particles breaching this shield depends on the orientation of the sun's magnetic field. It had been thought that when the sun's magnetic field is aligned with that of the Earth, the door is shut and that few if any solar particles enter Earth's magnetic shield. The door was thought to open up when the solar magnetic field direction points opposite to Earth's field, leading to more solar particles inside the shield also, twenty times more solar particles cross the Earth's leaky magnetic shield when the sun's magnetic field is aligned with that of the Earth compared to when the two magnetic fields are oppositely directed. THEMIS researchers used a computer simulation to discover where two holes frequently develop in Earth's magnetic field, one at high latitude over the Northern hemisphere, and one at high latitude over the Southern hemisphere. The holes form over the day lit side of Earth, on the side of the magnetic shield facing the sun.

In general words When the next peak of solar activity comes, in about 4 years, electrical systems on Earth and satellites in space may be more vulnerable.

F . *interactions between Earth's magnetic field and Sun's magnetic field*

Both the sun's magnetic field and the Earth's magnetic field can be oriented northward or southward (Earth's magnetic field is often described as a giant bar magnet in space). The sun's magnetic field shifts its orientation frequently, sometimes becoming aligned with the Earth, sometime becoming anti-aligned.

Scientists had thought that more solar particles entered Earth's magnetosphere when the sun's field was oriented southward (anti-aligned to the Earth's), but the opposite turned out to be the case, the new research shows also When the fields aren't aligned, "the shield is up and very few particles come in and when the fields are aligned, it creates a huge breach, and there's lots and lots of particles coming in.

According to above text when the fields were aligned — particles turned out to be about 20 times the number that got in when the fields were anti-aligned And while the interaction of anti-aligned particles occurs at Earth's equator, those of aligned particles occur at higher latitudes both north and south of the equator. The interaction is "appending blobs of plasma onto the Earth's magnetic field"**.**

Next Solar cycle: The Sun operates on an 11-year cycle, alternating between active and quiet periods. We are currently

in a quiet period, with few sunspots(Fig.2) on the sun's surface and fewer solar flares, It is expected to peak around 2012, bringing lots of sunspots, flares and coronal mass ejections (CMEs). CMEs can interact with the Earth's magnetosphere, causing problems for satellites, communications, and power grids.

This upcoming active period now looks like it will be more intense than the previous one, which peaked around 2006, some scientists think. The reason is the changes in the sun's alignment.

During the last peak, solar fields hitting the Earth were first anti-aligned then aligned. Anti-aligned fields can energize particles, but in this case, the energy came before the particles themselves, which doesn't create much of a fuss in terms of geomagnetic storms and disruptions.

But the next cycle will see aligned, then anti-aligned fields, in theory amplifying the effects of the storms as they hit.

These problems have related with each other ,means they are occur constantly one by one in 100 years period of time.

G. *what will occur when these problems come?*

When reversal of magnetic field start completely the strength of magnetosphere will be less , but this change is few and only cause to magnetic field will be unable to reflect high energy particles means magnetosphere is not magnetic mirror (the result of this happen is create aurora in every place).

This change can not cause to destroy our life but has several destructive results on our health.

But here we have another problem , interactions between magnetosphere of the Earth and magnetosphere of the Sun.

The result of this problem is inter more high energy particles to the Earth . when these particles hit to the frail magnetosphere , the number of high energy particles that hit to the Earth's surface increase .

Also these interactions create some holes in magnetosphere , these holes increase the number of particles that come in to the Earth .

Solar activities are frailest problem because the cycle of these activities (Fig.2, Fig.3) repeat in special period , means one period of time these activities are more and are in dangerous situation and another period are less therefore this problem need to more research to find its situation.

According to FTE theory , magnetic portal between Earth and Sun , transfer more energy and when this energy hit to the frail magnetic field , it can not against with energy and all this energy hit to the Earth's surface .

These problems together with each others cause Earth's destruction , any one of these problems alone can not destroy our life.

III. PROBLEM SOLUTION

A. *THE ONLY METHOD*

According to above sentences if magnetic field being less, repairing of it is necessary .

For repairing magnetic field should enrich its strength .adding new magnetic field to it to old Earth's magnetic field can solve this problem.

Decreasing magnetic field is rather a bout several micro Tesla perhaps this amount seems to be less but this radius is so important.

Transforming magnetic lines between NMP and SMP is very difficult because of magnetic field strength .

If magnetic field will be less the only way to returned it into its last phase is adding new energy and field to it .

For adding new magnetic field to Earth's field need to a system generating magnetic field that could use with Earth's field.

B. *STRACTURE OF SYSTEM*

In this system a characteristic is more important and that is use two particular types of superconductor elements . these types are:

1) Gadolinium 2) type 2 of superconductors

B.1. up to gadolinium

Name: Gadolinium
Symbol: Gd
Atomic Number: 64 /[Xe]4f ^{7} 5d^1 6s^2
Atomic Mass: 157.25 amu
Melting Point: 1311.0 °C (1584.15 K, 2391.8 °F)
Boiling Point: 3233.0 °C (3506.15 K, 5851.4 °F)
Number of Protons/Electrons: 64
Number of Neutrons: 93
Classification: rare earth
Crystal Structure: Hexagonal

Density @ 293 K: 7.895 g/cm^3

Single electrons: 8

According to these properties we can measure its magnetic property by this equation, by solving this equation we find Xm for superconductors is <<1

$$Xm = Nm^{\circ 2}\mu/3KT \qquad (1)$$

m°=several magenton Bohr

N=number of atoms in a volume

T=temperature (Kelvin)

this metal has an unusual property , this is :

when Gd placed into liquid nitrogen , it get magnetic characteristic{like other superconductors} but its magnetic field has a problem.

In simple if a thin cylinder placed into the cold place [liquid Nitrogen] one of its poles generate magnetic field and the other pole do not has any thing .

This characteristic is so important in our system , Gd is the main metal in system for its special conditions.

We can use this property for transforming magnetic field between NMP and SMP also we have the other subject that must pay attention to it .

Magnetic field in a point between two slice of Gd is equal with magnetic field of a magnetic dipole in that point so use magnetic dipole's equations in our subject is not matter .

Gadolinium's magnetic field is temporary and we do not need to its strength , we only need to its sense vectors[only needed to a vector to up].

B.2. type 2 of superconductors

Gadolinium's magnetic field is so less and is not useful in this magnetic field. The only metals which can generated strong magnetic field are this special type of superconductor elements.

These metals have complex structure which do not follow to London equations and only BCS theory can explain some of their structures .

Super conductors type 2 are complex type of super conductors that higher than a special strength of magnetic field that called Hc1 , magnetic flux started to come into the element.

Superconductor type 2 doesn't show Maisner influence Between Hc1 , Hc2   completely.

Also do not followed London's equations

$$B=\mu Hc2 \qquad (2)$$

H=strength of magnetic field in special temperature

In simple; Niobium-tin,Nb3Sn in 4.2 K° has $\mu Hc2=10$Tesla which this magnitude is more.

Hc find by solving this equation that has director communication with T

$$Hc=H,[1-(T/Tc)^2]. (3)$$

Tc=highest temperature that material is super conductor

T=273 K°

H=strength of magnetic field in T

Also its Tc = 18.1 K and The central solenoid coil will produce a field of 13.5 teslas. The toroidal field coils will operate at a maximum field of 11.8 T. these measures are so useful for us to find suitable metal for our other parts of system.

we only use Low-temperature superconductor in this system , so we need to refrigerator to refrigeration system means, The refrigeration requirements here is defined as electrical power to operate the refrigeration system. As the stored energy(equation 9) increases by a factor of 100, refrigeration cost only goes up by a factor of 20. Also, the savings in refrigeration for an HTSC system is larger (by 60% to 70%) than for an LTSC systems and this is problem for using LTSC

instead of using HTSC, so this is better for us , to use these two types of superconductors for decreasing costs.

For decreasing temperature, we must use strong magnetic field to decrease temperature for superconductors , when superconductors take place in strong magnetic field and low temperature , they will began and magnetic field increase but the strength of first magnetic field will be less.

C. *MAGNITUDE OF MAGNETIC FIELD*

The magnitude of the earth's field is about 0.5 Gauss (50 micro Tesla), but at the Earth's surface the total intensity varies from 24,000 nanotesla (nT) to 66,000 nT. Other units likely to be encountered are the Gauss (1 Gauss = 100,000 nT), the gamma (1 gamma = 1 nT) and the Ørsted. therefore if we decide to solve equations we can use this measure .

Now introducing some equation which is useful:

1) the magnetic field generated by a magnetism metal in a point (x,y,z).this equation will be brief according to magnetosphere structure .

$$B(r) = \mu/4\pi \int \rho m (r-r`)/ |r-r`|^3 dv` + \mu/4\pi \int \sigma m (r-r`)/|r-r`|^3  da` +\mu M(r)$$
$$(4)$$

ρm , σm (are excited when M vector has a

vertical component on metal's surface)= the strength of magnetic field in poles

r= special distance from magnetism metal

M= magnetize vector

2) M vector in a net magnetic element:

$$y=m\circ\mu Hm/KT \qquad\qquad |M|=Nm\circ[coty-1/y]$$
$$(5) \qquad\qquad\qquad\qquad (6)$$

N=number of molecules

m°=eh/4πm°

K=constant

3)density of energy in a magnetic field but the energy density of the magnetic field is small in comparison with that of the solar wind plasma(0.4 - 2 cm$^{-3)}$. This is because the southward IMF component enhances the coupling between the solar wind and the magnetosphere/ionosphere system . also in this paper is more equations on finding magnetic energy in several conditions , because of the importance of magnetic energy to find suitable elements and suitable external electric current,

$$u= \tfrac{1}{2} H.B \qquad or \qquad u= \tfrac{1}{2}B^2/\mu \quad (7)$$

$$U= \int u dv = U=\tfrac{1}{2}\int H.B dv \quad (8)$$

u= density of energy in magnetic field

U=magnetic energy in a volume

4)Magnetic energy that stored in superconductor coil is important to find our special superconductor

$$E = \tfrac{1}{2}L.I^2 \qquad (9)$$

L= inductance

I=current

Thus:

5) magnetic energy that stored in superconductor cylindrical coil

$$E=\tfrac{1}{2}.f(\xi,\delta).R.N^2.I^2 \qquad (10)$$

E=energy

I=current

f(ξ , δ)=form function(joules per ampere-meter)

N=number of rounds

6) scalar potential, V ,in the Earth's magnetic field:

$$V= a \sum_{H=0}^{\infty} \sum_{M=0}^{n} (a/r)^{n}+1(g^{n\prime} \cos m\, \phi + h^{n\prime} \sin m\, \phi)P^{n\prime}(\cos\theta)$$

$$(11)$$

θ,ϕ= the Earth's longitude and latitude

a= radius of the Earth

r= distance from centre of the Earth

n= degree of term

n´= degree of order

$P^{n\prime}(\cos\theta)$= the associated Legendary function

$g^{n\prime}$, $h^{n\prime}$ = Gauss coefficients

7)magnetic energy for a circuits

$$U=\tfrac{1}{2}I^2 2(L_1 X^2+2MX+L_2)>=0 \qquad I_{1,2} >0 \qquad (12)$$

I=current

X=I1/I2

8)magnetic energy on space generated by circuit

$$U=\tfrac{1}{2}\int J.A\, dv \qquad (13)$$

J=density of current in circuit

A=potential vector

V= special volume that we need density of energy here.

E(8)=E(13)

9)scalar potential of magnetic field

$$\Phi(p)=- I\Omega/4\pi \qquad (14)$$

Ω=special Angle between point P and circuit

10)faraday's law, this equation is true for all states of shapes and temperature conditions, so we can use it all the time.

$$\blacktriangledown \times E=- \partial B/\partial t \qquad (15)$$

E=electric field

11)magnetic momentum for magnetic element, this component is so important because all the magnetic field equations have communication with m.

$$dm= \tfrac{1}{2}r\times J\, dv \qquad (16)$$

V=volume

J=density of current

Some of these equations help us to find suitable magnitude of magnetic field which can face with high energy charges released from the Sun and the some other help us to design our system according to natural data and superconductors properties on store energy.

D. *PLASMA PARTICLES IN A MAGNETIC FIELD*

That equation which can explain proton's behave in a magnetic field is so important because of duty of our field.

Particles released from Solar activities [protons, electrons and ionized hydrogen] are plasma particles and all equations used on a particle in magnetic field seem to be true in our system.

Earth's magnetic field come together in a point in north pole this field has proportion to the space and these field's lines compress constantly till magnetic field's lines get together in a point.

A particle in a magnetic field reflect to the frailest place of magnetic field and this reflection is spiral lines. We can find that force which send particles to frailest part of magnetic field the magnetic field's lines come together in a point and particle go to this point with spiral motions . these motions continue till this spiral will be smaller and arrive to a point so reflected by magnetic field .

We can explain particle motion in Earth's magnetosphere by using two theory:

1)Orbit theory is according to particles motion , a particle with mp mass move in a magnetic field by this force:

$$F= q(E+V\times B) \qquad (17)$$

q= electric charge

E=electric field

V=particle's velocity

B=magnetic field

Also particle move around the force vector, the general orbit is spiral, that its radius is Larimore radius:

$$R = m_p \, V^{\perp} / q \, B \qquad (18)$$

Magnetic momentum of a particle in during of arriving to finally point , move into the strongest place of magnetic field and the Larimore radius come to be less and particle's velocity come to be less step by step too, and in finally we have magnetic mirror (magnetosphere)

2)Hydromantic, is the other way to explain plasma particle's motion in a magnetic field like magnetosphere .

According to macroscopic force on unit of volume :

$$F_v = J \times B - \blacktriangledown P \qquad (19)$$

 J= density of current

 $\blacktriangledown$ =curl (gradient)

That P is plasma's pressure , therefore magnetic pressure is equal with density of energy.

$$P_m = B^2 / 2\mu \qquad (20)$$

E. *PARTICLES'S EQUATIONS*

We imaging a vector with is on guidance centre it will be equal to Y vector .

So the best equation which explain that force influencing on particles is :

$$F_y = -m \, \partial B_y / \partial y \qquad (21)$$

m= particle's mass

also for Fx, Fy we have similar equations.

The kinetic energy of a particle in a magnetic field do not change because of Lorentz force that always is vertices on particle's velocity .

K∥ and K⊥ are not fix and we can write an equation that finally is above equation.(K∥ = K that is series with magnetic field.)

If the strength of magnetic field will be change this equation will have a problem and need to rewrite.

Sense of Y component is always in the sense that send particle to frailest part of magnetic field [north pole].

Our magnetic field was reflecting particle away from the earth in during of several million years from first till now.

But Can this field do its tasks in future while we know Reversals take a few thousand years to complete?

F. *solenoid ,loops, triode*

In our system we have several shapes with difference equations but we know Ampere's law equation can solve all of them , but show some of them is good.

Of course in our system , we need combine shapes.

 1)magnetic field of a superconductor triode (type1 of

$$B = \mu H = B^{\circ} k - B^{\circ} a^3 / r^3 \cos\theta \ a_r - \tfrac{1}{2} B^{\circ} \, a^3 / r^3 \sin\theta \ a_\theta \qquad (22)$$

 a= radius of triode

 B°k= external magnetic field

r= distance of a point from centre

aθ,r =spherical coordinate.

H=strength of magnetic field

At the end of changes B>>B°

2)magnetic field of a normal triode

$$B = \mu N I / 2R \qquad (23)$$

I=current

R=triode radius

N=number of rounds

3)magnetic field of a superconductor cylinder (type1 superconductors) , superconductors type 2 do not follow this equation.

$$B = \mu H = \mu I^{\circ} / 2\pi r \ a_\theta \qquad (24)$$

I°=internal current

a= radius

aθ=spherical coordinate.

r= distance from centre r>< =a

4)magnetic field of a solenoid , but this equation is brief the correct equation is 25.1

$$B = \mu N I / L [\cos \acute{\alpha} + \cos\alpha / 2] \quad (25.1)$$
$$B = \mu n I \qquad (25)$$

n= number of rounds in length unit

I=current

N=number of rounds

L=length of solenoid

ά,α=angles between our point and centre

5)magnetic field of a Helm hotter triode, Helm hotter triode is two coil used in creation strong magnetic field

$$Bz= \mu NI/a *S \qquad (26)$$

a= radius of triode

N=number of rounds

I= current

$S=8/5^{3/2}$

Attention: Helm hotter triode only has Bz.

6)scalar potential of magnetic solenoid in cylindrical coordinate (this coordinate is so better that other coordinates)

$$\varphi=- 1/2\pi\theta \qquad (27)$$

θ= component of cylindrical coordinate.

7)magnetic force on a part of circuit generated by external factor , controlling this force is necessary for stable system and energy.

$$F=+(\partial U/\partial x)_I \qquad (28)$$

U=magnetic energy

I= this component show this equation is on I changeable and all changes are in strength of current

IV. CONCLUSION

The dipolar part of the geomagnetic field has been decaying rapidly during the last few hundreds of years. In addition to this classical argument, from Information theory applied to geomagnetism, there are some evidences that the recent Earth magnetic field is showing characteristics typical of a reversal in progress. Therefore find suitable way to reduce these damages that LEO satellites preset some of them , due to the vicinity of "clouds" of electric particles (Van Allen belts) to the Earth's surface .in addition to reversal , Earth will against to some other problems such as change in solar activities , that is so important than other problems and interactions between magnetosphere of Earth and Sun that result to created holes in Earth's magnetic field and interring high energy particles to the Earth's surface . all of these problems have serious effect on environment and life and distractive effects on our satellites around Earth.

I'm sure that all of you have seen the super computer model of Earth's magnetic field before and during reversal poles, seeing the during reversal picture is very trouble , if in our era magnetic field change to this picture we get into the trouble therefore we must do a program immediately before magnetic field enter to its **choice** like the during reversal picture of super computers model.

Although , the human life won't destroyed without magnetic field but its damages are so harmful for our healthy and our technology , but we can not only predict future's events.

In this paper I try to show a good way to against to these problems or perhaps solve some of them by using magnetic technology and superconductors also I use some equation that are important in system because that magnetic field which we decide to create it in future will need all these equations but a bout superconductors type 2 , we have not any formula to explain our materials in system.

Perhaps you think this dangers will not occur but if these dangers were real , we get into the trouble, therefore find a suitable way to against to these problems is necessary and need to international activities in future , when dangers will be felling.

Attention: all the units are in **SI**.

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