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ABSTRACT

Natural energization of electrons and protons is accomplished with and through the production of external magnetic field (EMF), whenever these particles interacted with moving or rotating magnetic lines of force. With abundant charged particles, the continuation of both mechanisms could lead to proton and electron's fusion as consequential resultant of produced intense EMF. This paper investigates some crucial main relations and sequence of the three mechanisms based on the magnetic interaction hypothesis (MIH), thus proposing new methods for energies transformations, that could benefit humanity.

Note: Figures can be found at the end of the article.

1: INTRODUCTION

Sunspots are important signs for the start of solar activities; they are interpreted as the cooler areas on the sun surface [1]. It's formed by intense magnetic fields that have enormous number of magnetic lines of force [2]. Evidence of sunspots sticking out from the sun by curved magnetic field had been found [3]. Its appearance is linked with the start of the solar flare [2], hence ignition of intense geomagnetic storms on earth [4] leading to different phenomena such as the aurora [5]. Solar flares are known to erupt in Galaxies and stars [2], such as the SGR 1900+14, a neutron star about 45,000 light years away [3] that produced magnetic fields of $8x10^{10}$ Tesla [6].
The geomagnetic storms started when solar flare's protons and electrons processed and re-energized to various energies in specific regions, such as the shock waves (bow shock) [7], with existence of abnormal high magnetic fields (these fields are referred to here as external magnetic field or EMF). The interaction regions producing EMF, existed near 1 AU, it also existed between 1 and 5 AU, and deep in the geomagnetic tail [8, 9], and it's always accompanied with a shock fronts [10]. Anomalous magnetic fields that accompanied shock waves were interpreted as interplanetary magnetic field (IMF), the detection of EMF at 13.18 Re [11] formed the bases behind IMF, which was interpreted as been produced by the motion of the plasma [12] or that it is dragged from the sun by the plasma [13] then settled on the later [14], although multiple EMF several times in magnitudes had been detected between 17-27 R_e in the neutral sheet of magnetotail [14, 8,15] hence, can EMF (or IMF) in the magnetotail

perform the Archimedean spiral, or any rotation while shaded from the sun by the magnetosphere?

The low energy interplanetary particles are energized in the bow shock [7, 16] then transferred into the magnetosphere through the magnetosheath [17].

These energized particles forms the ring current [14], Van Allan radiation belt [18,19], and the stable aurora red arcs [20], while aurora oval [21] is thought of as a different mechanism.

Although the idea of producing intense magnetic field outside atom, with ability of changing atom's characteristics was mentioned by Kapitza [22], and had bee suggested as a possible propellant for UFOs [23] but the separation of IMF (or EMF) from earthly surface magnetic disturbances [13] brought about theories such as the electric current in the outer layer of the magnetosphere [24], all of which lead to the present confused situations

This paper investigates some crucial main relations and sequence of these three related mechanisms, based on the MIH [25], Spinning Magnetic Force (SM-Force) [26] and Element of Magnetic Lines of Force (EOMLF) [27]. These mechanisms are based on energization of charged particles on macro-scales that enable it producing EMF, hence after a sequence of intense EMF build up, that could lead to the fusion of the gyrating particles.

Therefore, the 11¼ years cycle that leads to the formation of intense sunspots [1] is thought of as a timely energization process of charged particles while gyrating around magnetic lines of force, synchronized with production of intense EMF leading to the fusion of charged particles, thus resulting in the solar flares.

These mechanisms represent the universal energies production or transformations in the Galaxies, stars, comets and some planets. It also represents energization of charged particles to various spectrums that produce aurora and other phenomena in our planet and Jupiter; therefore, it may turn to be an important method for energy transformation that may help enriching continuation of humanity cycle.

2: ENERGIZATION OF CHARGED PARTICLES PHASE-I

2.1 MICRO-ENERGIZATION OF CHARGED PARTICLES

On micro-scales, energization of charged particles by a moving or rotating magnetic field [25] gives the kinetic energy K express as

$$K = B_1 B_2 r_m^2 c d \sin\theta = q v_c B_1 d \sin\theta \quad J \qquad \{1\}$$

Where, B_1 is the rotating magnetic field (movement of geomagnetic field or the comets around the sun, while geomagnetic field also rotate daily with the earth) in Tesla, B_2 is the circular magnetic field in Tesla (CMF) produced by the charged particle, r_m is the magnetic radius in meter, d is the distance moved or rotate by the magnetic field B_1 in meter, θ is the angle between the two fields during the capturing process, q is the elementary charge in Coulomb, v_c is the velocity of charged particle when captured and the kinetic energy K is in joules (J). Thus Eq.{1} represents the bases for further building block.

3: EXTERNAL MAGNETIC FIELD (EMF)

3.1 MICRO EMF PRODUCTION

As shown in Fig.1, micro production of EMF represents the imposition of CMF on magnetic line of force of field B_1, Hence

$$B_E = B_1 + B_2 = B_1 + \frac{q\, v_c}{r_m^{\,2}\, c} = B_1 + \frac{q^3\, B_1^{\,2}}{m^2\, v_c\, c} \qquad T \qquad \{2\}$$

Where, m is the mass of the charged particle in kg.

3.2 PRODUCTION of INTENSE EMF PHASE-ONE

If number of electrons or protons interacted with moving or rotating magnetic lines of force along one meter is denoted by (n_m), it have field intensity (B_1), therefore produced EMF shown in Fig.2, is given by

$$B_E = (\, B_1 + n_m\, l\, B_2\,) = B_1 + n_m\, l\, \frac{q^3\, B_1^{\,2}}{m^2\, v_c\, c} \qquad T \qquad \{3\}$$

Where, l is the effective length of the magnetic lines of force around which charged particles are gyrating.

3:3 VERTICLE MAGNETIC FORCES

In the system above, a vertical magnetic force produced from adjacent CMF_2 [25] attracts adjacent orbital electrons or protons towards each other, along the guiding centre as shown in Fig.{2}, the force is given by

$$F_{mV} = B_{V1}\, B_{V2}\, r_{mv1}\, r_{mv2}\, c \qquad N \qquad \{4\}$$

Where, B_{V1} and B_{V2} are magnitudes of two tangents CMF_2 (B_{V1}) in adjacent orbits, r_{mv1} and r_{mv2} are radius of each CMF_2 (B_{V2}), c is the speed of light in ms^{-1} and the vertical magnetic force (F_{mV}) or orbital lock force is in Newton.

As shown in Fig.2, When r_{mV} decreased, B_{V1} and B_{V2} becomes part of B_{EI} Eq.{4}, becomes

$$F_{mV} = B_{EI1}\, B_{EI2}\, r_{mv1}\, r_{mv2}\, c \qquad N \qquad \{5\}$$

3:4 PRIMARY AND SECONDARY EMF

Fig.2, shows the primary EMF (P-EMF) produced around magnetic lines of force of B_1 and given by Eq. {3}.

Secondary EMF (S-EMF) shown in Fig.2, is a combination of CMF with larger radius, therefore both fields participated in producing EMF by the following

$$\gamma_{ps} = \frac{2\, r_m}{r_m + 0.5\, r_s} \qquad \{6\}$$

Where, r_s is the distance between two CMF as shown in Fig.2, and γ_{PS} is the relative magnitudes of both P & S-EMF in production of EMF.

Substituting the gyrating radius $r_m = mv/qB$, in the above, the following is obtained

$$\gamma_{ps} = \frac{2\, m\, v}{m\, v + 0.5\, q\, B\, r_s} \qquad \{7\}$$

The S-EMF or B_S is given by

$$B_S = \frac{\gamma_{ps}\, B_{EI}}{10} \qquad T \qquad \{8\}$$

3:5 PRODUCTIONS OF INTENSE EMF-PHASE-TWO

Since number of magnetic lines of force is related to magnetic field intensity (B_1), [28], and it is equivalent to B_1 x 10^8 [27], therefore intense EMF (B_{EI}) produced in square meter, having both P & S-EMF is given by

$$B_{EI} = 10^8\ \gamma_{PS}\ B_P(B_P + n_m l B_2) = 10^8\ \gamma_{PS}\ B_P(B_P + n_m l \frac{q^3 B_P^{\ 2}}{m^2 v_c c}) \quad T \quad \{9\}$$

Where, B_P is the previous field intensity. From Eq.{8} the following is obtained

$$B_{EI} = 10^8\ \gamma_{PS}\ B_P + (10^8 \times n_m l B_P B_2) = 10^8(\gamma_{PS}\ B_P^{\ 2} + \frac{\gamma_{PS}\ n_m\ l\ q^3 B_P^{\ 3}}{m^2 v_c c}) \quad T \quad \{10\}$$

From Eq{10}, number of charged particles producing specific B_{EI} is given by

$$n_m = \frac{m^2\ v_c\ c}{l\ q^3\ B_P^{\ 3}}(\frac{B_{EI}}{10^8\ \gamma_{PS}} - B_P^{\ 2}) \qquad \{11\}$$

The effects of the EMF (B_{EI}) is to reduce radius of gyration, therefore by substituting the right hand part of Eq.{10} in the equivalent of centripetal with magnetic force, the following is obtained

$$r_{mE} = \frac{n_o\ m\ v_c}{10^8\ \gamma_{ps}\ q(B_P^{\ 2} + \frac{n_m\ l\ q^3\ B_P^{\ 3}}{m^2\ v_c\ c})} \qquad m \qquad \{12\}$$

Where, n_o is number of gyrating charged particles in each orbit.

4: ENERGIZATION OF CHARGED PARTICLES PHASE-II

4.1 MACRO-ENERGIZATION OF CHARGED PARTICLES

Since the magnetic field B_1 in Eq.{1} increased to B_{EI} given by Eq.{10}, thus decreasing the gyrating radius given by Eq.{12}, hence energization becomes

$$K = B_{EI}\ B_2\ r_{mE}^{\ 2}\ c\ d\ \sin\theta = q\ v_c\ B_{EI}\ d\ \sin\theta \quad J \qquad \{13\}$$

Substituting B_{EI} given by the right part of Eq.{10} in the right hand part of Eq.{13}, energization of charged particles resulted from produced intense EMF is given by

$$K = 10^8\ (d\ \gamma_{ps} q v_c B_P^{\ 2} + \frac{d\ \gamma_{ps}\ n_m\ l q^4 B_P^{\ 3}}{m^2\ c})\sin\theta \quad J \quad \{14\}$$

To include the K general at each step, we attach a subscript (i) to K so that K_i represents the energy given at step i hence

$$K_i = (10^8(d\ \gamma_{ps}\ q v_c\ B_P^{\ 2} + \frac{d\ \gamma_{ps}\ n_m\ l q^4 B_P^{\ 3}}{m^2\ c})\sin\theta\big|_i \quad J \quad \{15\}$$

Where the symbol $|_i$ indicates the value of K_i at the i step

Alternatively we may introduce a dummy variable δ_i that allow us to measure the change in energy in a given period of length l in such a manner its accessible to obtain an approximate reading during this arbitrary period, hence, K_i can be approximate as:

$$K_i = 10^8 \delta_i (d\ \gamma_{ps}\ q v_c\ B_P^{\ 2} + \frac{d\ \gamma_{ps}\ n_m\ l q^4 B_P^{\ 3}}{m^2\ c})\sin\theta \quad J \quad \{16\}$$

At the *i* step (*i* = 1, 2, …..n). Where $\delta_i = 1$ when B >9 nT, and $\delta_i = 0$ when B = 0. If B_{EI} in Eq{13} continuously increasing, then energy built up gained by charged particles may be approximately computed as measured

$$K_T = K_1 + K_2 + K_3 \ldots\ldots + K_n + \varepsilon \qquad J \qquad \{17\}$$

Where, K_1, K_2 … K_n are energization executed, $\varepsilon = \varepsilon_i$ where ε_i is the error of continuity approximation at step *i*, K_T is the total approximate energy acquired or gained by the charged particle in Joules. The new radius r_{mE} is given by

$$r_{mE} = \sqrt{\frac{K}{B_{EI}\ B_2\ c\ d\ \sin\theta}} = \frac{m\ v_c}{q\ B_{EI}} = \left(\frac{m v_c}{10^8 \gamma_{ps}\left(qB_P^{\ 2} + n_m l \frac{q^4 B_P^{\ 3}}{m^2\ v_c\ c}\right)}\right) \quad m \qquad \{18\}$$

The following are two examples showing spectrum product of energization process.

Mag. Field &EMF **n T**		Radius **m**		Force x10^{-22} **N**		Protons x10^5		P-EMF & S-EMF		Energy **eV** θ=75°	
										K	+ 856.18 **Capt.Energ.**
$\mathbf{B_1}$	11.0	$\mathbf{r_m}$	3796 25.0	$\mathbf{F_m}$	6.58 θ=75°	$\mathbf{n_1}$	0.5	γ_1	1.05	$\mathbf{K_1}$	+179.50 **1st Energ.** =***1035.68*** sub-total
$\mathbf{B_{EI1}}$	12.70	$\mathbf{r_{ME1}}$	3288 09.06	$\mathbf{F_{m1}}$	7.86	$\mathbf{n_2}$	0.96	γ_2	1.10	$\mathbf{K_2}$	+259.52 **2nd Energ.** =***1295.2*** sub-total
$\mathbf{B_{EI2}}$	17.74	$\mathbf{r_{mE2}}$	3253 93.18	$\mathbf{F_{m2}}$	10.98	$\mathbf{n_3}$	1.42	γ_3	1.15	$\mathbf{K_3}$	+529.40 **3rd Energ** =***1824.60*** sub-total
$\mathbf{B_{EI3}}$	36.19	$\mathbf{r_{mE3}}$	1153 87.54	$\mathbf{F_{m3}}$	23.19	$\mathbf{n_4}$	1.88	γ_4	1.20	$\mathbf{K_4}$	+2298.98 **4thEnerg.** = ***4122.58*** sub-total
$\mathbf{B_{EI4}}$	157. 16	$\mathbf{r_{mE4}}$	2657 0.85	$\mathbf{F_{m4}}$	100.7 2	$\mathbf{n_5}$	2.34	γ_5	1.25	$\mathbf{K_5}$	+45161.7 **5th Energ.** =***49284.35*** Total
The following step could occur at specific conditions											
$\mathbf{B_{EI5}}$	3210 .90	$\mathbf{r_{mE5}}$	1300. 53	$\mathbf{F_{m5}}$	2057. 77	$\mathbf{n_6}$	2.8	γ_6	1.30	$\mathbf{K_6}$	+19.6MeV**6thEnerg.** =***19.65*** **MeV T. Ene.**

Table.1. Interaction of Protons solar wind (400kms^{-1}) with geomagnetic field at 14.615 Re near down (θ=75°) resulted in EMF (or IMF) production (see Fig.2), and related different protons energization levels. K_6 shows sub-Cosmic rays possibilities.

Mag. Field &EMF n **T**		Radius **m**		Force x10^{-22} **N**		Electrons x10^5		P-EMF & S-EMF		Energy **e**V θ=75°	
										K	+ 0.45 **Capt. Energ.**
B_1	11.0	r_m	206.75	F_m	6.81 θ=75°	n_1	0.5	γ_1	1.05	K_1	+179.96 **1st Energ.** =***179.96*** sub-level
B_{EI1}	12.7	r_{ME1}	179.07	F_{m1}	8.14	n_2	0.96	γ_2	1.10	K_2	+250.592**nd Energ**. =***430.55*** sub-level
B_{EI2}	17.74	r_{mE2}	128.2	F_{m2}	11.37	n_3	1.42	γ_3	1.15	K_3	+**511.363rd Energ** =***941.91*** sub-level
B_{EI3}	36.19	r_{mE3}	62.84	F_{m3}	23.19	n_4	1.88	γ_4	1.20	K_4	+**2220.654thEnerg**. =***3162.56*** sub-level
B_{EI4}	157.17	r_{mE4}	14.47	F_{m4}	100.72	n_5	2.34	γ_5	1.25	K_5	+**43629.315thEnerg**. =***46781.87*** Total
The following step could occur at specific conditions											
B_{EI5}	3087.86	r_{mE5}	0.74	F_{m5}	1978.92	N_6	2.8	γ_6	1.3	K_6	17.52MeV**6thEnerg**. =***17.56*** **Me VT.Ene.**

Table.2. Interaction of electron's solar wind (400 kms^{-1}) with geomagnetic field at 14.615 Re near down (θ=75°) resulted in EMF (or IMF) production (see Fig.2), and related different energization values. K_6 shows very high energy production.

5 MAXIMUM REPRODUCTION OF EMF

5:1 VOLUME OF MAGNETIC LINES OF FORCE

In a system where captured charged particles are abundant and energization given by Eq.{16} is continual, orbital charged particles are denoted by n_o, orbits number in one meter along the lines of force is denoted by O_n, therefore the total number of gyrating charged particles in volume of magnetic lines of force [27] is given by

$$N_V = 10^8 n_o O_n l B_1 \quad \{19\}$$

Where, N_V is the number of charged particles gyrating in specific volume of magnetic lines of force.

5:2 THE ELECTRONS FUSION

As shown in Fig.4, intense B_{EI} given by Eq{10}decrease radius of gyration, given by Eqs.{12 and 18}, the circumference, and adjacent distances (r_r) between orbital electrons shown in Fig.2.a, reduced from (a) to (c), therefore production of EMF is at its maximum, substituting Eq.{19} with n_m l in Eq.{10}, hence

$$B_{EE} = 10^8 \left(\gamma_{ps} \; B_P^{\,2} + \frac{\gamma_{ps} \; n_o \; O_n \; lq^3 \; B_P^{\,3}}{m_e^{\,2} \; v_c \; c} \right) \quad T \qquad \{20\}$$

Where, B_{EE} is maximum EMF produced by electrons. The electrons orbital magnetic force (F_{ME}) is given by

$$F_{ME} = n_o \; B_{EE} \; B_{2e} \; r_{me}^{\,2} \; c = n_o \; q \; v_c \; B_{EE} \qquad N \qquad \{21\}$$

As shown in Fig.4 EMF production increased from intense B_{EI} to maximum B_{EE}, thus reducing radius of gyration from (a) to (b) to (c) leading to reduction of the circumference. This state is expressed by substituting r_m with $m_e v_c/qB_E$ hence

$$C = 2\pi r_m = \frac{2\pi m_e v_c}{q B_E} \quad m \qquad \{22\}$$

Relating Fig.4 with SMF radius r_r [25], and electron's radius [26], the circumference of gyrating particles is given by

$$C = n(2r_e \times 2r_r) \qquad \{23\}$$

Equivalent of Eqs.{22} and {23} gives the following SMF distance r_r

$$r_r = \frac{\pi m_e v_c}{2 n_o q r_e B_E} \quad m \qquad \{24\}$$

The EMF needed to give required r_r for Electron-Electron interaction as shown in Fig.2, [26] is given by

$$B_E = \frac{\pi m_e v_c}{2 n_o q r_e r_r} \quad T \qquad \{25\}$$

Therefore, distance r_r between adjacent electrons is reduced to fami range (10^{-15}), thus enhancing interaction of opposite spinning magnetic fields (SMF) [26], therefore, producing electrons-spinning magnetic force [26], leading to the electrons fusion. Due to these, the electron force (F_{ME}) given by Eq.{21} will be greater or equal to Electron-Electron interaction SM-force [26], hence

$$F_{ME} \geqslant F_{S(EE)} \therefore n_o q v_c B_{EE} \geqslant \{\frac{q^2}{4\pi\varepsilon_O r^2} + \frac{2n^2}{3}\frac{B_{TE}^{\,2}}{r_O(2(r_O + r_P)\ (nr_x)}\}c(\frac{B_{TE}^{\,2}}{r_r^{\,2}}c + \frac{B_{TE}^{\,2}}{((r_O\ \ r_r) + r_O)^2}c) \quad N \quad \{26\}$$

As state of Eq.{26}, is caused by B_{EE} of Eq.{20} resulted in r_r of Eq.{24}, electrons in orbits and along the line of force will fuse together, thus production of EMF will be terminated, lengthy fused electrons will be ejected from the system, like a long web, known in Ufology as Angle hair [29], gyration radius at this stage is

$$r_{mT} \quad \frac{n_o m_e v_c}{q B_{EE}} \quad T \qquad \{27\}$$

Production of EMF is ceased by condition given by Eq.{25}.

5:3 THE PROTONS FUSION

Like electrons, Fig.5 shows the sequences through which orbital protons radius is reduced, while maximum proton's EMF produced (B_{EP}) is given by

$$B_{EP} = 10^8(\gamma_{ps}\ B_P^{\,2} + \frac{\gamma_{ps} n_o O_n lq^3 B_P^{\,3}}{m_p^{\,2} v_c c}) \quad T \qquad \{28\}$$

Where, B_{EP} is the intense EMF produced by the protons. Proton's orbital magnetic force (F_{MP}) is given by

$$F_{mP} = n_o B_{EP} B_2 r_{mp}^{\,2} c = n_o q v_c B_{EP} \quad N \qquad \{29\}$$

As shown in Fig.5, EMF production increased from B_{EI} to maximum B_{EE} thus reducing gyrating radius from (a) to (b) to (c) leading to reduction of the circumference. This state is expressed by substituting r_m with $r_m = m_p v_c/qB_E$ hence

$$C = 2\pi r_m = \frac{2\pi m_p v_c}{q B_E} \quad m \qquad \{30\}$$

Relating Fig.5 with SMF radius r_r [25], and proton's radius [26], and Equivalent of Eqs.{23} and {30} the following is the SMF distance r_r

$$r_r = \frac{\pi\, m_p\, v_c}{2\, n_o\, q\, r_p\, B_E} \quad m \qquad \{31\}$$

The EMF needed to give required r_r for Proton-Proton interaction as shown in Fig.2, [26] is given by

$$B_E = \frac{\pi\, m_p\, v_c}{2\, n_o\, q\, r_p\, r_r} \quad T \qquad \{32\}$$

Therefore, distance r_r between adjacent protons is reduced to fami range (10^{-15}) thus enhancing interaction of opposite spinning magnetic fields (SMF), therefore, producing protons-spinning magnetic force (or the nuclear force), [26], leading to the protons fusion. This occurred because the proton force (F_{ME}) given by Eq.{29}is greater or equal to Proton-Proton interaction SM-force [26], hence

$$F_{mP} \leqslant F_{S(PP)} \therefore n_o q v_c B_{EP} \leqslant \{ \frac{q^2}{4\pi\varepsilon_O r^2} + \frac{2n^2}{3} \frac{B_{TP}{}^2}{r_O(2(r_O + r_P)\ (nr_x)} c \} \{ \frac{B_{TP}{}^2}{r_r{}^2} c + \frac{B_{TP}{}^2}{((r_O\ \ r_r) + r_O)^2} c \}\ N \quad \{33\}$$

The radius at which gyration is terminated, is given by

$$r_{mT} \quad \frac{n_o\, m_p\, v_c}{q\, B_{EP}} \quad T \qquad \{34\}$$

6: PROTONS FUSION and RESULTED ENERGY

Since fusion is a reaction in which light nuclei combined to form a nucleus of larger mass [30], therefore fused gyrating hydrogen nucleus may form several nucleuses with accompanied energies. This is facilitated by the transformation of protons into neutrons with the ejection of beta particle [31, 26]. This is thought to be one of the crucial mechanism forming solar flares, but since the major particles ejected by solar flares composed of deuterium, tritium and both helium that constitutes the major ejected particles, although ${}^{3}_{2}H_e$ constitute majority in some flares [2], therefore fusion shown in Fig.5, may lead to the following possibilities.

6:1 THE DEUTERIUM

In Fig.5, two hydrogen nuclei fused to produce hydrogen isotope deuterium after a proton changed to neutrons, having nucleons of proton and neutron with the emission of one positron (β^+) [31, 26] with an accompanied energy, the reaction equation is given by

$$2\,({}^{1}_{1}H) \rightarrow {}^{2}_{1}H + \beta^+ + Q \qquad \{35\}$$

If fused protons in the field volume given by Eq.{19} produces deuterium isotope, energy released for this interaction is 1.8 MeV, therefore, total energy resulted from deuterium reaction is given by

$$Q_{TD} = \frac{(1.8)(10^8\, n_o\, O_n\, l\, B_1)}{2({}^{1}_{1}H)}\ MeV \quad \{36\}$$

6:2 THE TRITIUM

In Fig.5, three hydrogen nuclei fused to give hydrogen isotope tritium, having nucleons of one proton and two neutrons, with the emission of two positrons (β^+) [31], and accompanied energy, the reaction equation is given by

$$3\,({}^{1}_{1}H) \rightarrow {}^{3}_{1}H + 2\beta^{+} + Q \qquad \{37\}$$

If all protons fused into tritium, while energy Q, released for the above interaction is 7.5 MeV, therefore, total resulted energy is given by

$$Q_{TT} = \frac{(7.5)(10^{8}\, n_o\, O_n\, l\, B_1)}{3({}^{1}_{1}H)}\ MeV \quad \{38\}$$

6:3 THE HELIUM

Fusion of four hydrogen nuclei as shown in Fig.5, could be transformed into the following helium products

6:3:1 THE HELIUM ISTOPE ${}^{3}_{2}He$

The reaction equation for helium isotope ${}^{3}_{2}H$ is given by

$$4\,({}^{1}_{1}H) \rightarrow {}^{3}_{2}He + {}^{1}_{0}n + 2\beta^{+} + Q \qquad \{39\}$$

If all protons fused into helium isotope, as usually occurred in the sun [2], while energy Q released, by above interaction is 6.7 MeV, therefore, resulted energy given by

$$Q_{THe} = \frac{(6.7\times 10^{8})(n_o\, O_n\, l\, B_1)}{4({}^{1}_{1}H)}\ MeV \quad \{40\}$$

6:3:2 THE HELIUM ${}^{4}_{2}He$

The reaction equation for helium ${}^{4}_{2}H$ is given by

$$4\,({}^{1}_{1}H) \rightarrow {}^{4}_{2}He + 2\beta^{+} + Q \qquad \{41\}$$

If all protons fused into helium, while energy Q, released for the above interaction is 24.7 MeV, therefore, resulted energy is given by

$$Q_{THe} = \frac{(24.7\times 10^{8})(n_o\, O_n\, l\, B_1)}{4({}^{1}_{1}H)}\ MeV \quad \{42\}$$

6:3:3 THE RELATIVE FUSION and ENERGY PRODUCTS

Since natural abundance of deuterium is 0.015%, tritum is 0.001%, helium isotope is 0.000138% and 99.999862 for helium [32], and therefore, the following are thought to be an estimated final percentage of the fusion product and energy

$$Q_{THe} = \frac{(0.015\%\times 1.8)+(0.0015\%\times 7.5)+(0.000138\%\times 6.7)+(99.983862\%\times 24.7)+(10^{8}\, n_o\, O_n\, l\, B_1)}{2({}^{1}_{1}H)+3({}^{1}_{1}H)+4({}^{1}_{1}H)+4({}^{1}_{1}H)}\ MeV \quad \{42\}$$

The energy could be given by

$$Q_{TE} = (0.0135 + 0.0025 + 0.00023115 + 617.4003479)(10^{8}\ n_o\ O_n\ l\ B_1) \quad M\,eV \qquad \{44\}$$

Therefore; the total energy is given by

$$Q_{TE} = 617.416579 \times 10^{8} \; (n_o \; O_n \; l \; B_1) \quad MeV \qquad \{45\}$$

6 CONCLUSION

1- This work is aimed at forming a base upon which, better understanding and development could be achieved in these immense field.
2- In the system where magnetic lines of force is moving or rotating, captured charged particles velocity (v_c) is fixed, whatever energization process that takes place.
3- An increase in the rotating magnetic field (B_1), appears as EMF (B_E), thus leading to new state of energization process.
4- The total amount of energy acquired by charged particles in moving or rotating magnetic lines of force is the summation of gained energy due to change in B_{EI}.
5- Proton's energies shown in Table.1 is related to production of EMF [33].
6- Magnitude of EMF (B_{EI}) represents that amount produced at specific stage.
7- Solar flares and related emission of x-ray, e.u.v. and acceleration of ${}^{3}_{2}He$ and ${}^{4}_{2}He$ are the consequences of the nuclear fusion resulted from the intense EMF as produced by charged particles before flare stage.
8- Detected magnetic field at around ± 13.6 Re that fluctuated in magnitude and direction, refered to as IMF [34] is thought to be the produced EMF.
9- Energy obtained in sec. 6 resulted from proton's fusion, could be derived using Eq.{15} in spinning magnetic force (or nuclear force) [26].
10- This work may help for better understanding of solar cycle's present changes among other [35].
11- Tables. 1 & 2 are simplified, to give the general idea of deriving both EMF and spectrum energies.
12- Using Eq.{8}, the value of B is derived from Table.1&2, gives 20 nT.
13- The Forbush decrease in Cosmic-rays, is related to the accomplishment energization steps further than the 4th step.

7 REFERENCE

[1] Hammer, S. Robert C. 1971 Introduction to Space Science, John Wiley and Sons, Inc. N.Y.
[2] Parker, E.N. 1979 Cosmical Magnetic Fields, Their Origin and Their Activity, Clarendon Press, Oxford.
[3] http://WWW.science.nasa.gov/headlines/y2003/12sep_magnetars.htm?list558599
[4] http://www.oulu.fi/~spaceweb/textbook/
[5] Hultqvist 1967 (Aurora) Physics of Geomagnetic Phenomena Vol.II, Edit. By S. Matsushita and Wallace H. Campbell, Academic Press, New York.
[6] http://WWW.solomon.as.utexas.edu/~duncan/magnetar.html.
[7] Sarries, E. T., S.M. Krimigis and T.P. Armstrong, March 1976 Observation of a High-Energy Ion Shock Spike in Interplanetary Space, Geophysical Research Letters, Vol. 3, No. 3.
[8] Heppner J.P. 1967 (Satellite and Rocket Observations) Physics of Geomagnetic Phenomena, Vol.II, Edit. By S. Matsushita and Wallace H. Campbell, Academic Press, New York.

[9] Scarf, F.L., L.A. Frank, K.L. Ackerson and R.P. Leepping, September 1974 Plasma Wave Turbulence at Distant Crossing of The Plasma Sheet Boundaries and the Neutral Sheet, Geophysical Research Letters, Vol. 1, No. 5.
[10] Smith, Edward J. and John H. Wolf, March 1976 (Observation of Interaction Regions and Co rotating Shocks Between One and Five AU: Pioneers 10 and 11, Geophysical Research Letters, Vol. 3, No. 3.
[11] Sonett, C.P., D.L. Judge and J. M. Kelso, August, 1959 Evidence Concerning Instabilities of the Distant Geomagnetic Field: Pioneer I, Journal of Geophysical Research, Vol. 64, No 8.
[12] Gold, Thomas, November, 1959 Plasma and Magnetic Fields in the Solar System, Journal of Geophysical Research, Vol. 64, No 11.
[13] Parker, Eugene November, 1959 Extension of the Solar Corona into Interplanetary Space, Journal of Geophysical Research, Vol. 64, No 11.
[14] King, J.W. and W.S. Newman (Editors), 1967 Solar-Terrestrial Physics, Academic Press, London.
[15] White, R. Stephen 1970 Space Physics, Gordon and Breach, Science Publication, New York.
[16] Gloeckler, G. and F.M. Ipavich June1974 Post-Shock Spikes: A new feature of proton and Alpha Enhancements Associated with an Interplanetary Shock Wave, Geophysical Research Letters, Vol. 1, No.2.
[17] Eastman, T.E., E.W. Hones Jr., S.T. Bame and J.R. Asbridge, November 1976 The Magnetospheric Boundary Layer: Site of Plasma, Momentum and Energy Transfer From Magnetosheath Into The Magnetosphere, Geophysical Research Letters, Vol. 3, No.11.
[18] Van Allen, James, November, 1959 The Geomagnetically Trapped Corpuscular Radiation, Journal of Geophysical Research, Vol. 64, No 11.
[19] Kern, John W. 1967 "Magnetosphere and Radiation Belt" Physics of Geomagnetic Phenomena, Edit. By S. Matsushita and Wallace H. Campbell, Vo.II, Academic Press, N.Y.
[20] COLE, K.D.1967 (On the D Main Phase and certain Associated Phenomena), Physics of Geomagnetic Phenomena, Vol.II, Edit. By S. Matsushita and Wallace H. Campbell, Academic Press, New York.
[21] Akasofu, S.I. 1967 (The Aurora Oval and The Internal Structure of Magnetosphere) AURORA AND AIRGLOW, Proceeding of The NATO Advanced Study Institute held at the University of Keele Staffordshire, England, August 15-26 1966, Edit. By Billy M. McCormac, Reinhold Publishing Corporation, New York.
[22] Kapitza, P. 1967 Collected Papers of P. Kapitza (The Production of and Experiments in Strong Magnetic Field), Edited by D. Ter Hear, Pergamon Press, Oxford.
[23] Ashpole, Edward 1995 The UFO Phenomena, Headline, London.
[24] Akasofu, S.I. and S. Chapman 1967 (Geomagnetic Storms and Aurora) Physics of Geomagnetic Phenomena, Vol.II, Edit. By S. Matsushita and Wallace H. Campbell, Academic Press, New York.
[25] Yousif, Mahmoud E. "The Magnetic Interaction", Comprehensive Theory Articles, Journal of Theoretics, Vol. 5-3, June/July 2003, or at: http://www.journaloftheoretics.comLinks/Papers/MY.pdf .
[26] Yousif, Mahmoud E. Spinning Magnetic Field, Theoretics, Vol. 5-5, Oct-Nov 2003. Comprehensive Theory Articles at: http://www.journaloftheoretics.com/Links/Papers/MY-S.pdf

[27] Yousif, Mahmoud E. ELEMETS OF THE MAGNETIC LINES OF FORCE, Journal of Theoretics, Vol. 5-5, Oct-Nov 2003. Comprehensive Theory Articles at: http://www.journaloftheoretics.com/Links/Papers/MY-E.pdf
[28] Nightingale E., 1958 Magnetism and Electricity, G. Bell and Sons Ltd. London.
[29] Spencer, John 1991 The UFO Encyclopedia, Headline, Glasgo.
[30] Trinklein, F. E. 1990 Modern Physics, Holt, Rinehart and Winston, N.Y).
[31] Elwell D. and A.J. 1978 Pointon Physics for Engineers and Scientists, Ellis Horwood Ltd. Chester.
[32] EMSLEY, Jhone 1991 The Elements Clarendon Press, Oxford.
[33] McCormac, Billy 1967 (Introduction) AURORA AND AIRGLOW, Proceeding of The NATO Advanced Study Institute held at the University of Keele Staffordshire, England, August 15-26 1966, Edit. By Billy M. McCormac, Reinhold Publishing Corporation, New York.
[34] Sonett, C.P., E.J. Smith and A.R. Sims 1960 (Surveys of The Distant Geomagnetic Field, Pioneer 1 and Explorer VI) Space Research, Proceeding of the First International Space Science Symposium Nice, January 11-16, 1960, Ed. By Hilde Kallmann Bijl, North-Holland Publication Company, Amesterdam.
[35] http://www.science.nasa.gov/headlines/y2003/12nov_haywire.htm?list558599

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FIGURES 1-5

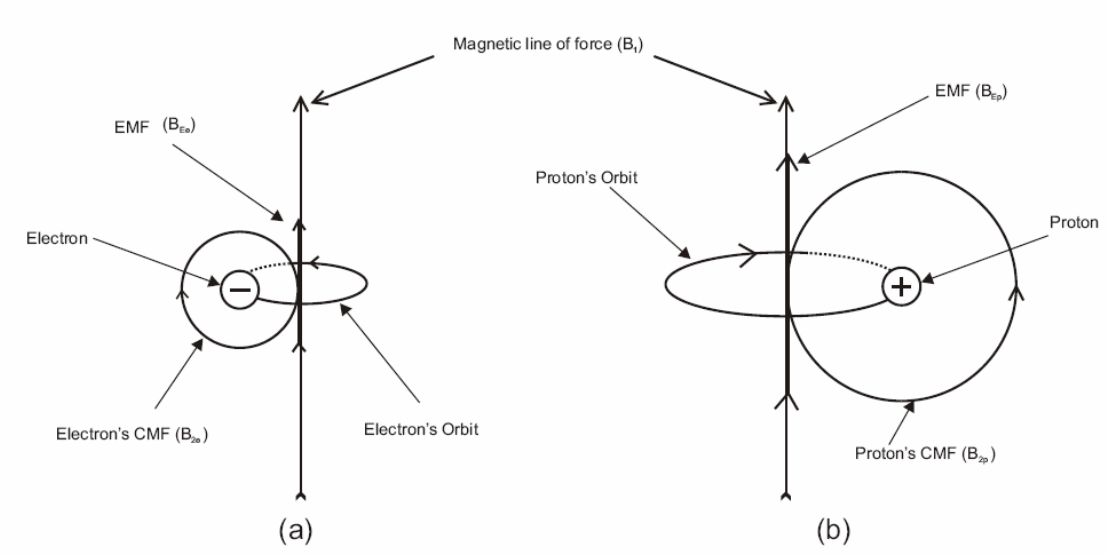

Fig. 1. Micro production of External magnetic field (EMF) by an electron in (a) and proton in (b) resulted from interaction of both particle's circular magnetic field (CMF) with Magnetic line of force (B_l) [25].

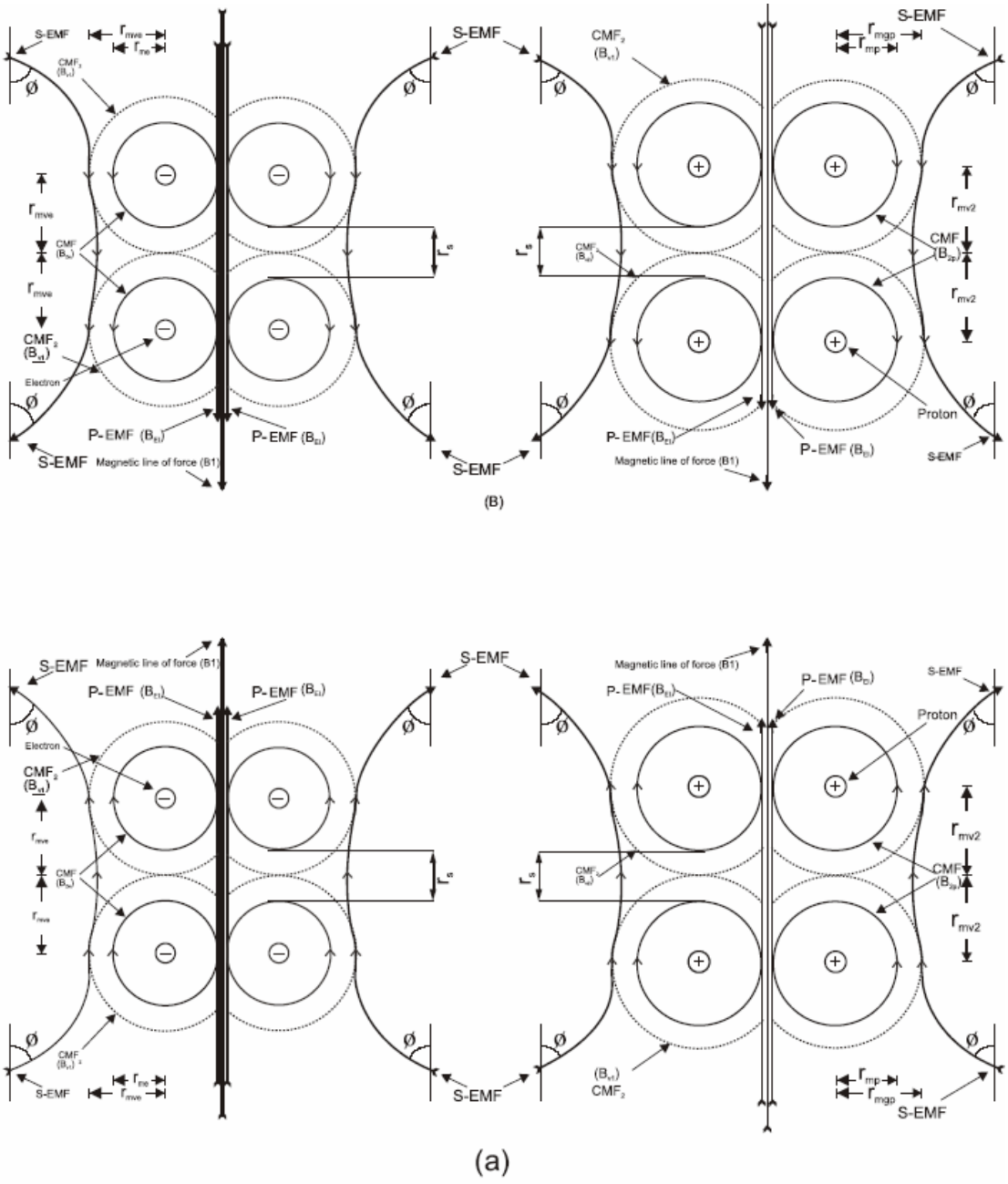

Fig.2. Cross-section along magnetic line of force (B_1) showing solar wind interaction with northern-geomagnetic field in (a) and southern-geomagnetic fields in (b),at 14.6 Re producing both primary and secondary magnetic field (P-EMF & S-EMF), forming the shock front. Angle ø is formed between S-EMF, and the line parallel to the P-EMF or B_1 (the line extending from the earth to the sun). Different parameters are shown.

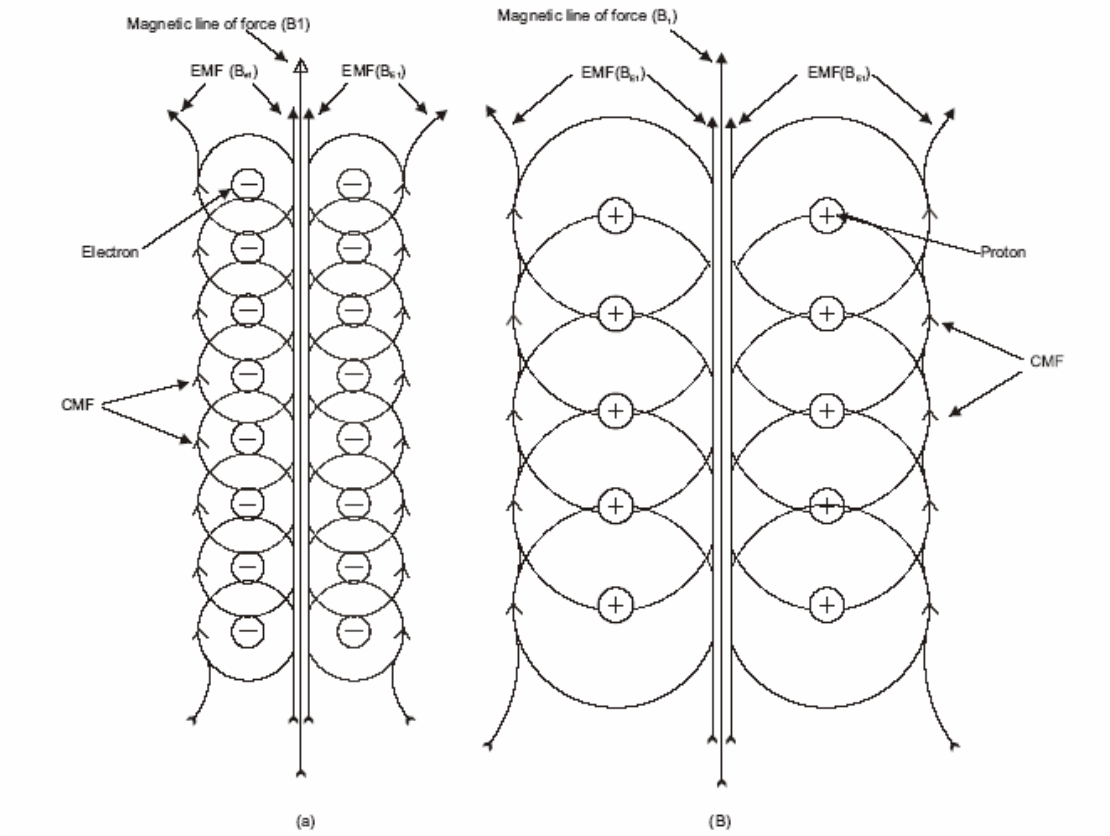

Fig.3. Intensive production external magnetic field (EMF) by an electrons in (a) and protons in (b). Orbits are brought together by the guiding center attractive force (F_{mv}) shown in Fig.2, leading to different electrons and protons orbits coming together.

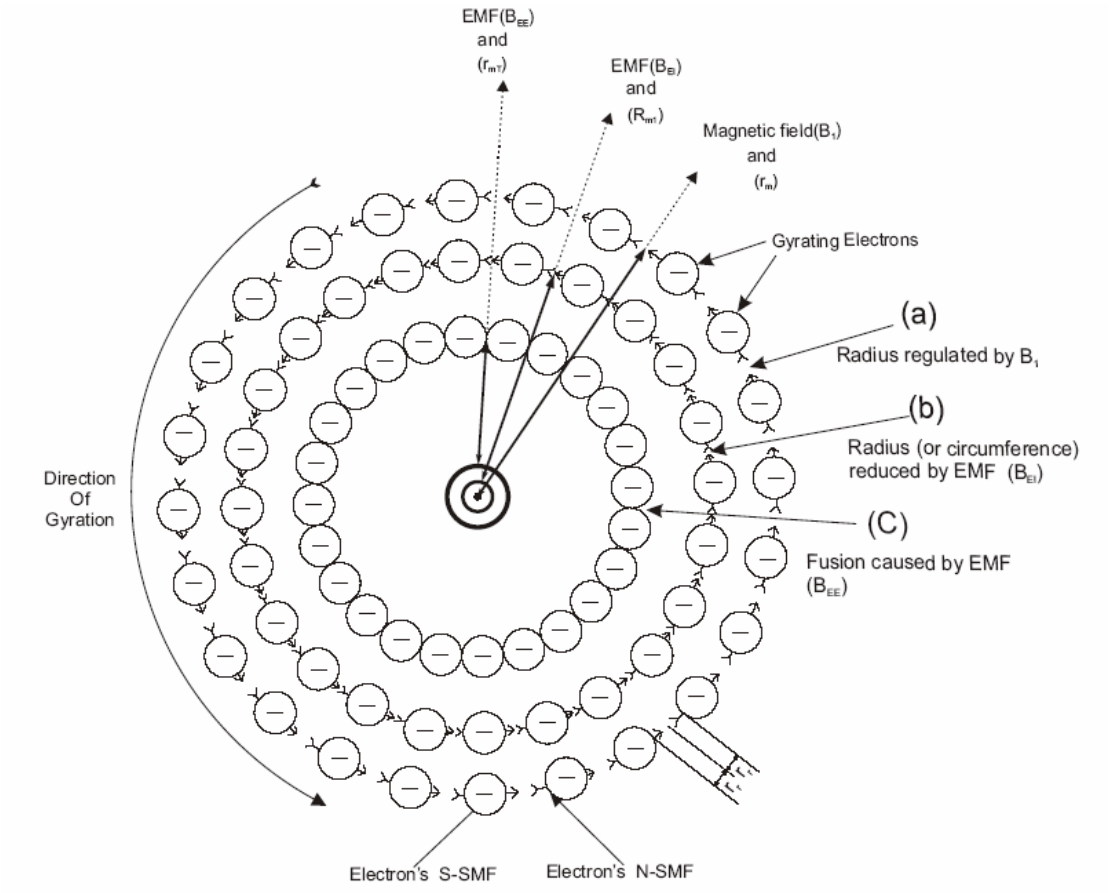

Fig.4. Cross-section of orbital gyrating electrons showed Fig.3.a. Produced external magnetic field (EMF_s) given by B_{EI} to B_{EE} reduced the radius of gyration, orbital circumference hence the distance between adjacent north (N) and (S) spinning magnetic field SMF) [25]. Interaction of SMF produced spinning magnetic force (SM-Force) and orbital fusion [26].

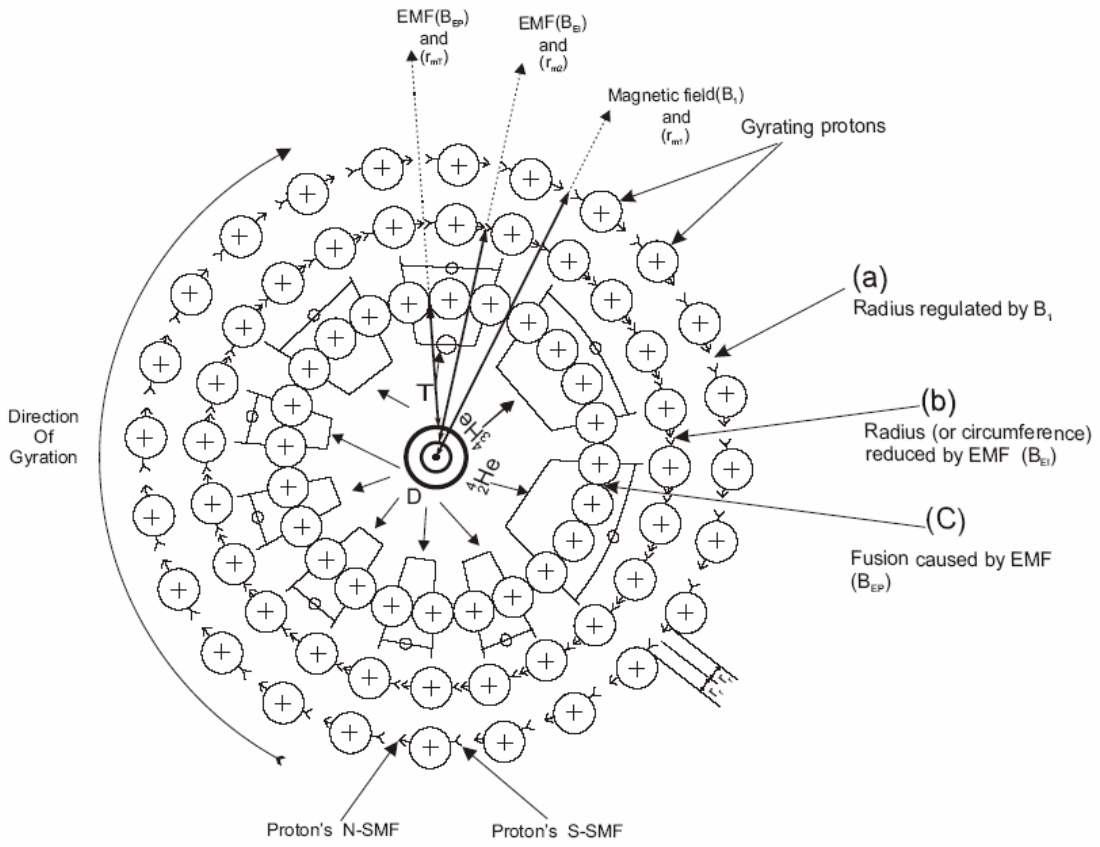

Fig.5. Cross-section of orbital gyrating protons showed Fig.2.b. Produced external magnetic field (EMF_s) given by B_{E1} to B_{EE} reduced the radius of gyration, orbital circumference hence the distance between adjacent north (N) and (S) spinning magnetic field SMF) [25]. Interaction of SMF produced spinning magnetic force (SM-Force) and orbital fusion [26], where protons could be transformed into higher elements.

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