THE SPINNING MAGNETIC FORCE

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ABSTRACT

Formulas for magnitudes of the spinning magnetic field (*SMF*) produced by protons, electrons and neutrons are derived. Interaction mechanism between each group of particles and with others produced spinning magnetic force (*SMFs*) of different magnitudes. Energies resulted from these interactions and mass changed are derived.

1- INTRODUCTION

The need for an alternative source of energy, combined with need to explain many phenomena, leads to the establishment of the Magnetic Interaction Hypothesis (***MIH***), [1], in which the nature and mechanism of the nuclear force had been established as an interaction caused by spinning magnetic field (***SMF***), the example of proton-proton interaction was given. Characteristics of neutrons, that it disintegrate at period of 918 seconds [2], it possess major characteristics of both electrons and protons, except elementary charge, it disintegrates into an electron and a proton [3], it exist in cosmic rays by being liberated from atomic nuclei [4], it spins like the other fundamental particles [5], it produced spinning magnetic field (***SMF***) that would be caused by spinning point charge with negative charge of about 1.9 times the fundamental unite [3]. Based on ***MIH*** [1], these characteristics were reorganized with a postulation that, the interaction of electrons and protons through ***SMF*** and electrostatic field producing an attractive spinning magnetic force (***SMFs***) and electrostatic force, leading to the integration of both particles, interactions mechanism and equations for these particles are shown, electrostatic mechanism for neutrons formation had been suggested [6] and a way of generating neutrons from hydrogen atoms was assumed [7], all of which reflects trend for restoration of order. The strong ***SMFs***, bring change in energy and mass of the particles in line with Einstein's relation relating both. Understanding particles interaction could clarify the mechanism behind atomic structure, molecules formations production of external magnetic field and nuclear fusion leading to the understanding of the building blocks for various higher mechanisms that accompanied fusion in stars and planets or different other phenomena.

2- SPINNING MAGNETIC FIELD
2.1 PROTON SPINNING MAGNETIC FIELD

The total magnetic field (B_T) identified as the spinning magnetic field (*SMF*) produced above poles of spinning particles [1], is derived from Newton's second law, Coulomb's electrostatic law and Biot-Savart law for magnetic field in/outside a loop. As shown Fig.1, magnitude of the total magnetic field (B_{Tp}) given by

$$B_{TP}=B_{1P}\,r_r^{\;2}=\frac{\mu_O q}{4\pi}\sqrt{\frac{q^2 r_o}{\varepsilon_O f_{ps} m_p r_p^{\;2}}}=1.525710414\times10^{-18}\,Tm \qquad \{1\}$$

Where, B_{IP} is proton's *SMF* (B_{IU} for nucleus hydrogen atom), f_{ps} is the proton's spinning frequency, r_o is the radial distance from proton surface to a point at which B_{TP} is produced (r_o=0.468 fm), r_r is distance from proton's surface along the magnetic field, μ_o is the permeability of the free space, ε_o is the permittivity of free space the B_{Tp} is in Tesla. Fig.1, shows the relative structure of protons **SMF**.

2.2 NEUTRONS SPINNING MAGNETIC FIELD

Since neutrons data imply that it have an internal structure which include positive and negative charges [8], therefore re-arrangements of known data lead to assumption that neutrons are resulted from interaction of both electrons and protons, where they oppositely spins within one sphere. Since opposite gyration of electrons and protons around fixed center produced magnetic fields of same direction, [9] therefore, combination of both fields in neutron is given by

$$B_{TN}=B_{1N}\,r_r^{\;2}=\frac{\mu_O q}{4\pi}\sqrt{\frac{2q^2 r_o}{\varepsilon_O f_{ns} m_n r_n^{\;2}}}=2.918748102\times10^{-18}\,Tm \qquad \{2\}$$

Where, B_{1N} is the neutron **SMF**, f_{ns} is neutron spinning frequency it is a combination of proton's spinning frequency (f_{ps}) and electron's spinning frequency (f_{es}), $f_{ns} = f_{ps}$ x f_{es} B_{TN} is in Tesla. Fig.1, shows the relative structure of neutrons **SMF**.

2.3 ELECTRON SPINNING MAGNETIC FIELD (ESMF)

It is thought that, while in neutrons electron's spinning frequency (f_{es}) is reduced according to electron-proton mass ratio (1/1836.152756). Therefore, electron spinning frequency (f_{es}) is given by

$$f_{es}=\frac{f_{ns}\times m_p}{f_{ps}\times m_e} \qquad s^{-1} \qquad \{3\}$$

Where, m_e is electron mass and the electron spinning frequency f_{es} is in s^{-1}.
Therefore, electron's total produced spinning magnetic field (*ESMF*) is given by

$$B_{TE}=\frac{\mu_O q}{4\pi}\sqrt{\frac{q^2 r_o}{\varepsilon_O f_{es} m_e r_e^{\;2}}}=2.913035602\times10^{-19}\,T.m \qquad \{4\}$$

Where, r_e is the electron radius, B_{TE} is in Tesla. Fig.1, shows the relative structure of electrons SMF.
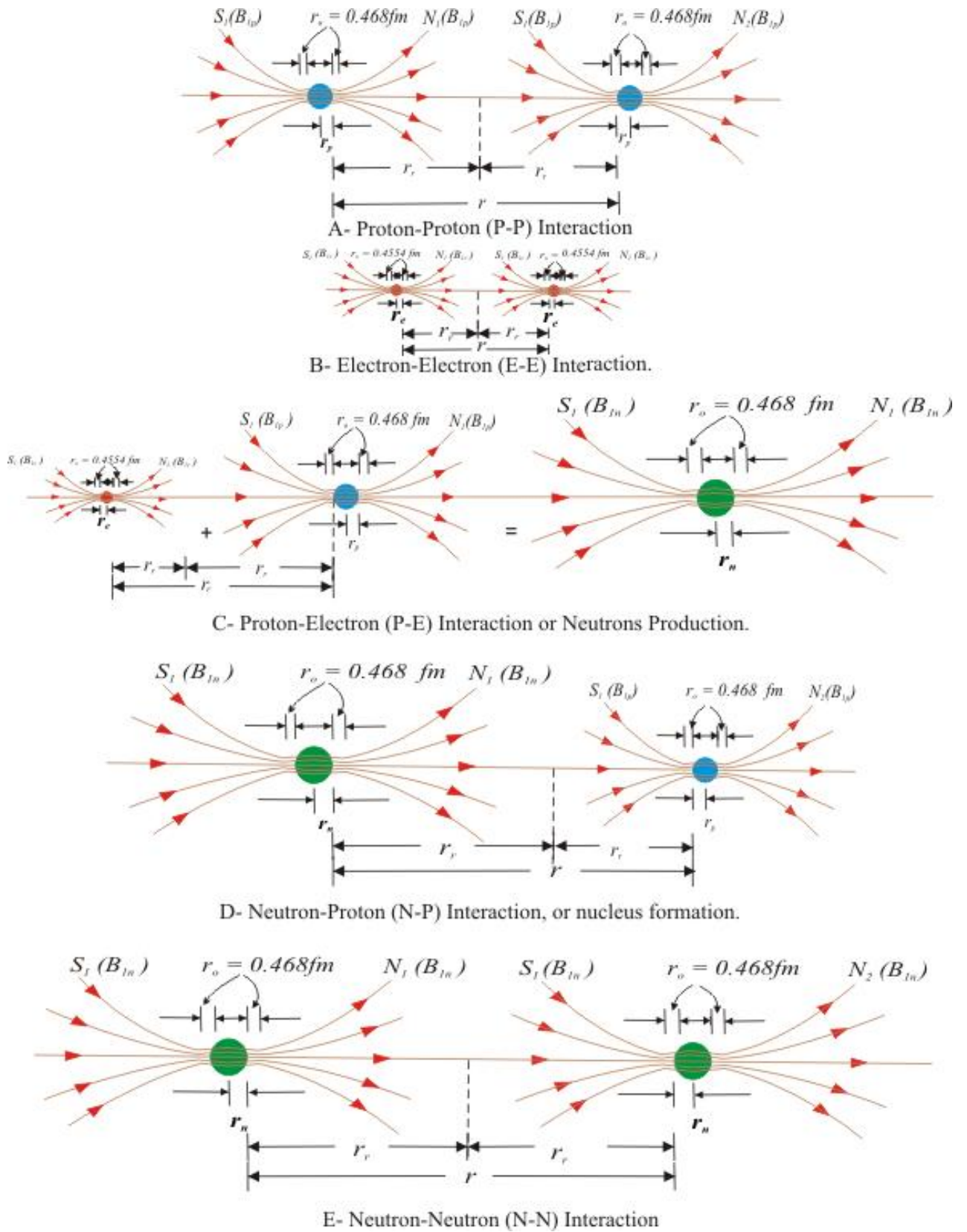
Fig.1. Relative intensities of spinning magnetic field (*SMF*) and interaction mechanism for *P-P*, *E-E*, *E-P* (Neutron production), *P-N* and *N-N*. The figure also shows interaction parameters.

3- THE SPINNING MAGNETIC FORCE (SMFs)

3:1 PROTON-PROTON INTERACTION

Interaction between two proton's **SMF** produced spinning magnetic force (**SMFs**) which is the nuclear force for nucleons [1]. Taken Coulomb force under consideration, the result of two protons **SMFs** is given by

$$F_{S(PP)} = \left\{ \frac{q^2}{4\pi\varepsilon_O \, r^2} + \left(\frac{2\,n^2}{3} \left(\frac{B_{TP}^{\;2}}{r_O\,(2\,(r_O + r_P) - (nr_x)} \; c \right) \right\} - \left\{ \left(\frac{B_{TP}^{\;2}}{r_r^{\;2}} c \right) + \left(\frac{B_{TP}^{\;2}}{((r_O - r_r) + r_O)^2} c \right) \right\} \quad N \quad \{5\}$$

Where, **n** is the number of steps moved by **SMF** starting from r = 0.8 fm (r_r = 0.4fm), **r_x** is the distance moved at each step (r_x = 0.05fm), the **SMFs** (**$F_{S(PP)}$**) (or nuclear force for nucleons) is in Newton. Characteristics of **SMFs** resulted from proton-proton (**P-P**) interaction, is shown in Fig.2.

3:2 ELECTRON-ELECTRON INTERACTION

Under certain conditions electrons interacts with each other, produced **SMFs** **$F_{S(EE)}$** is given by

$$F_{S(EE)} = \left\{ \left(\frac{q^2}{4\pi\varepsilon_O \, r^2} \right) + \left(\frac{2\,n^2}{3} \left(\frac{B_{TE}^{\;2}}{r_O\,(2\,(r_O + r_P) - (nr_x)} \right) c \right) \right\} - \left\{ \left(\left(\frac{B_{TE}^{\;2}}{r_r^{\;2}} \right) c \right) + \left(\left(\frac{B_{TE}^{\;2}}{((r_O - r_r) + r_O)^2} \right) c \right) \right\} \quad N \quad \{9\}$$

Where, **B_{TE}** is the electron's **SMF** in Tesla. Characteristics of **SMFs** resulted from Electron-Electron (**E-E**), is shown in Fig.2.

3:3 ELECTRON-PROTON INTERACTION (NEUTRON PRODUCTION)

Interaction of electron's and proton's **SMF** produced attractive **SMFs** and mutual electrostatic force. As shown in Fig.2, result of magnitude for both forces increases at very short distances, finally leading to the integration of both particles, thus with both particles spins oppositely, therefore neutralizing each other charge that responsible for the production of circular magnetic field (**CMF**).

The **SMFs** is given by

$$F_{S(PE)} = \left\{ \frac{2\,n^2}{3} \left(\frac{B_{TP}\,B_{TE}}{r_O\,(2\,(r_O + r_P) - (nr_x)} \right) c \right\} - \left\{ \left(\frac{q^2}{4\pi\varepsilon_O \, r^2} \right) + \frac{B_{TP}\,B_{TE}}{r_r^{\;2}} c + \left(\frac{B_{TP}\,B_{TE}}{((r_O - r_r) + r_O)^2} \right) c \right\} \quad N \quad \{6\}$$

Where, **B_{TE}** is the electron's **SMF** in Tesla. Characteristics of **SMFs** resulted from Electron-Proton (**E-P**) interaction, is shown in Fig.2.

3:4 PROTON-NEUTRON INTERACTION

Whenever proton's and neutron's **SMF** comes under each other field of influence, a **SMFs** **$F_{S\,(PN)}$** (or nuclear force) is produced, the force is given by

$$F_{S(PN)} = \left\{ \left(\frac{2\,n^2}{3} \left(\frac{B_{TP}\,B_{TN}}{r_O\,(2\,(r_O + r_P) - (nr_x)} \right) c \right) \right\} - \left\{ \left(\left(\frac{B_{TP}\,B_{TN}}{r_r^{\;2}} \right) c \right) + \left(\left(\frac{B_{TP}\,B_{TN}}{((r_O - r_r) + r_O)^2} \right) c \right) \right\} \quad N \quad \{7\}$$

Where, **B_{TN}** is the neutron's **SMF** in Tesla, the **SMFs** **$F_{S\,(PN)}$** is in Newton. Characteristics of **SMFs** resulted from Proton-Neutron (**P-N**) interaction, is shown in Fig.2.
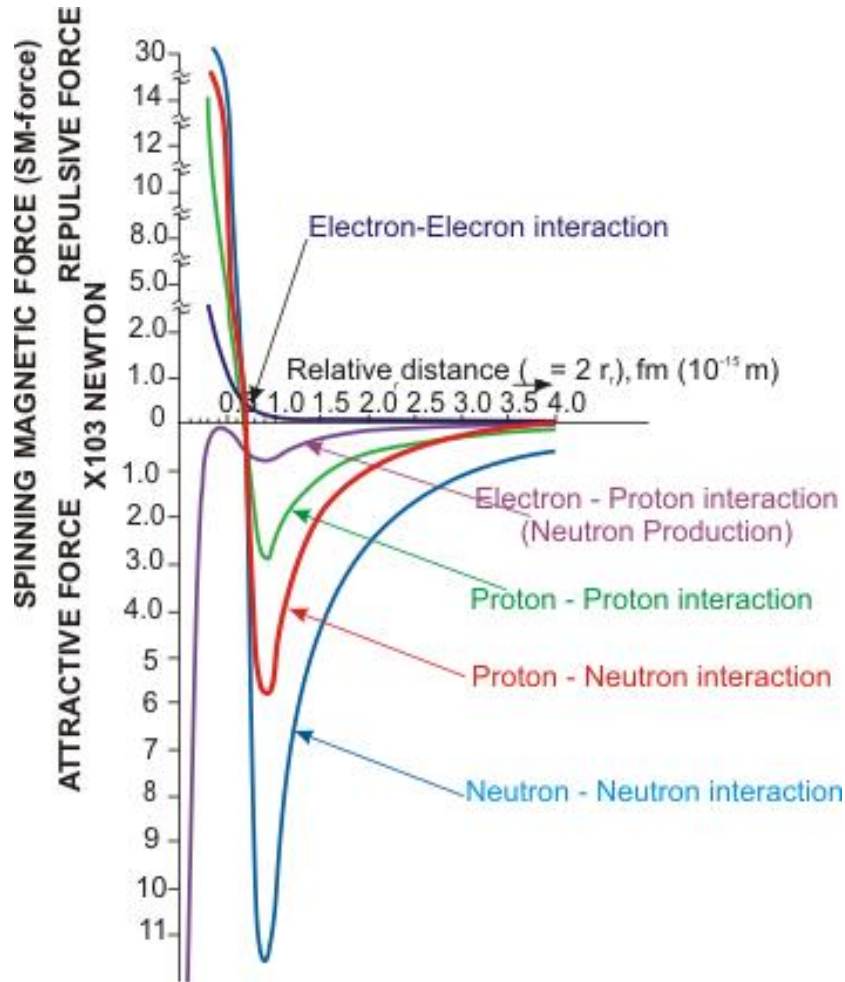
Fig. 2. Spinning magnetic force (**SMFc**) resulted from interaction of Electron-Electron (**E-E**), Proton-Proton (**P-P**), Electron-Proton **E-P** (Neutral production), Proto-Neutron (**P-N**) and Neutron-Neutron (**N-N**). **SMFc** also Represents the Nuclear force for nucleons.

3:5 NEUTRON-NEUTRON INTERACTION

Whenever two neutron's **SMF** comes under each other influence as shown in Fig.1-E, a **SMFs** $F_{S\,(NN)}$ (or nuclear force) is produced, the force is given by

$$F_{S(NN)} = \{(\frac{2\,n^2}{3}(\frac{(B_{TN})^2}{r_O(2(r_O+r_P)-(nr_x)})c)\} - \{((\frac{(B_{TN})^2}{r_r^2})c)+((\frac{(B_{TN})^2}{((r_O-r_r)+r_O)^2})c)\} \quad N \qquad \{8\}$$

Where, $\mathbf{B_{TN}}$ is the neutron's **SMF** in Tesla. Characteristics of **SMFs** resulted from Neutron-Neutron (**N-N**) interaction, is shown in Fig.2.

4- THE NUCLEAR ENERGY

4:1 NEUTRON MASS

Electrons and protons interaction give raise to great velocity and energy within **SMF** therefore the energy of the system as given by Eq.{14} [1] is related to Einstein's relation of mass and energy, thus the following is obtained

$$E = B_1\,B_2\,r_m^2\,c\,d\,\sin\theta = (\frac{B_T^2}{r_r^2})c\,d = mc^2 \quad J \qquad \{10\}$$

From Eq.{10}, resulted neutron mass is given by

5

$$m_n = (m_p + m_e) + (\frac{B_{TP} \, B_{TE} \, d \sin \theta}{r_r^2 \, c}) \ kg \qquad \{11\}$$

Where, m_p and m_e are the proton and electron mass in kg respectively, c is the speed of the light in $m.s^{-1}$, and the neutron mass m_n is in kg.

4:2 NUCLEUSES MASS DEFICIENCY

Interaction between nucleons (**N-P** and **N-N**), cause nucleus mass deficiency, the interaction of intense *SMF* is thought to cause nuclear mass deficiency thus

$$m_{pd} = m_p \ - \frac{B_{TP} \, B_{TN} \, d}{r_r^2 \, c} \ kg \qquad \{12\}$$

Where, m_p is proton's rest mass and m_{pd} is proton mass in the nuclei.

While, interaction of two neutrons is given by

$$m_{nd1} = m_p \ - \frac{B_{TP} \, B_{TN} \, d}{r_r^2 \, c} \ kg \qquad \{13\}$$

Where, m_{nd1} is neutron mass in kg resulted from N-P interaction, while interaction of **N-N** inside nucleus, cause nuclear mass deficiency, the new neutron mass (m_{nd2}) is express by

$$m_{nd2} = m_n - (\frac{B_{TN}^2 \, d}{r_r^2 \, c}) \ kg \qquad \{14\}$$

Where, m_n is the neutron rest mass and m_{nd2} is the neutron mass in nucleus.

4:3 MASS DEFICIENCY IN GENERALY

The general equation for obtaining mass of a nucleus is given by

$$m_u = N_p \{ m_p - (\frac{B_{TP} \, B_{TN} \, d}{r_r^2 \, c}) \} + N_{n1} \{ m_{n1} - (\frac{B_{TP} \, B_{TN} \, d}{r_r^2 \, c}) \} + N_{n2} \{ m_n - (\frac{B_{TN}^2 \, d}{r_r^2 \, c}) \} \ kg \qquad \{15\}$$

Where, N_p is the number of protons, N_{n1} is the number of neutrons interacted through **P-N**, N_{n2} is the number of neutrons interacted through **N-N** the nucleus mass m_{ud} is in kg.

5- CONCLUSION

1- This paper present what thought to be the basic ideas about *SMF* and *SMFs* produced and resulted from the elementary particles.

2- *SMFs* form the nuclear force in nucleus, it also give the important **E-N** interaction among many others.

3- The four major interactions (**E-P**, **P-P**, **P-N** and **N-N**) gives the same shapes, it only differ in magnitudes.

4- Graph of **E-P** interaction could never easily be measured because of it is illusiveness.

5- As protons and neutrons are important in nucleus formation, so electrons and protons are important in the production of external magnetic field (*EMF*) and Neutrons formation.

6- **E-E** interaction operates within the repulsive range of the graph.

7- Decrease of *SMFs* for **E-P** interaction at r < 0.9 fm due to the repulsive force latter overcome by electrostatic force.

8- These ideas should give better understanding to block structure of many phenomena, among them, the aurora, nuclear fusion and the structure of new flying objects (**NFO's**).

9- In nucleus, combination of electrons and protons *SMF* behave and rotate as one unit, when disintegrated, both particles start precession, thus bringing change in the axis of *ESMF* and *PSMF*, therefore repelling each other magnetically.

10- The value of some parameters are: $r_o = 0.468$ fm, $r_p = r_n = r_e = 1.1060236231 \times 10^{-15}$ m, $f_{ps} = 0.079577471$ S, $f_{es} = 3683.223344$ s^{-1}.

11- Physical constant used, [2] are: $q = 1.60217733 \times 10^{-19}$ C, $m = 9.1093897 \times 10^{-31}$ kg. $h = 6.6260755 \times 10^{-34}$ J.s, $m_p = 1.6726231 \times 10^{-27}$ kg, $m_n = 1.6749286 \times 10^{-27}$ kg. and , $\varepsilon_o = 8.854223 \times 10^{-12}$ C^2.N^{-1}.m^{-2} [5]

AKNOWLEDGMENT

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