A NEW SCIENTIFIC THEORY OF GEO-MAGNETISM

S. K. Srivastava

Former Professor of Physics, Devi Ahilya University, Indore, India & Founder and Patron member of International Disordered Systems Associates Society, 113 / 4 , Alopi Bagh-211006, Allahabad, India <indias_matri@yahoo.co.in>.

Abstract

There is role of Sun in developing gravitational and magnetic fields of the Earth. A number of charged particles emitted by Sun move all around above and below to the earth's surface. Those charged particles which exist in the ionosphere form convection current and they are the source of developing magnetic field. The dynamics of different radiating fields have been followed through a new scientific theory of author based on order and disorder concepts. Very interesting results about Geo- magnetism have been found.

Sun is the main source of radiating energy of this universe. There is role of Sun in developing gravitational and magnetic fields of the Earth. It is known that in the Earth and the Sun the magnetic and rotational axes are inclined at very small angle, which shows a close connection between magnetism and gravitation. Sun emits a number of charged particles, which move all around above and below to the Earth's surface. The existing charged particles in the ionosphere form convection currents, which are the source of developing magnetic field. Such electric currents are produced due to the ionization of layers of air surrounding the surface of the earth, which are the main cause of Earth's magnetic field.

According to the known fact the magnetic field exists 10.6×10^4 km below the Earth crust. Good amount of magnetite and ferromagnetic materials exist not only in the Earth's crust but also inside earth. The rotation of Earth and the dynamic action of convection currents towards the earth inner surface develops largely the Earth's magnetic field. An exercise about the movement of a radiating field, especially with the escape velocity $V_E = (2gs)^{1/2} = 45$ km / sec [where 's' is taken as depth of 10.6×10^4 km inside Earth up to which Earth's magnetic field exist] inside earth may reveal some interesting results. This dynamics is followed here through new scientific theory of author.

Recently, in a series of research papers on Order and Disorder Scientific Philosophy [Website: http://it.science..cmu.ac.th/ejournal/], in part-II [Chiang Mai J. Sci. 2012; 39(4): iv-vi], the author introduced the concept of a probability distribution function f (E, t) in the well known Heisenberg Uncertainty Principle [$\Delta E.\ \Delta t \rightarrow \geq h / 2$; h: Planck's constant] of atomic systems. This was in order to bring the integral space for all the existing systems of Nature and Universe in line with the new scientific theory based on Order- Disorder Scientific concepts as in:

$$\iint f(E, t)\, \Delta E.\, \Delta t \approx (1 / 2\pi) \approx \iint f(D, O)\, \Delta D.\, \Delta O, \qquad (1)$$

which agrees with the Heisenberg result:

$$\Delta \upsilon.\, \Delta t \approx (1/2\pi), \qquad (2)$$

where υ is frequency and t is time. This new concept of the author reflects the dual nature of determinism and indeterminacy in every physical phenomenon. Moreover, this new representation is subject to the law of averages and there is no finality of existence.

Here, for the case of launching of the photon radiating field of energy $\boldsymbol{\varepsilon} = h / t$ [h **:** Plank's constant] inside (i) the Earth's gravitational field of value $(\boldsymbol{\varepsilon_o})_{gr} = 2\, m\, g_{eff}^{\,2}\, t^2$ [$g_{eff} = g \pm g(D)$; where g is the value of acceleration due to gravity on the surface of Earth, m is mass of Boson or photon - mass less particles and g(D) is the fractional value of acceleration due to gravity with respect to depth- D inside the Earth] and (ii) the Earth's magnetic field of value $(\varepsilon_o)_H = H_k / t^2$, where H_k ($H_k = 4\pi^2 I / M$; I is the moment of Inertia and M is the magnetic moment) ; i.e. total field $\varepsilon_o = (\varepsilon_o)_{gr} + (\varepsilon_o)_H$, the corresponding distribution function is given by

$$f(E, t) = \exp(E / \boldsymbol{\varepsilon_o}).\ \exp(-\boldsymbol{\varepsilon} / \boldsymbol{\varepsilon_o}), \qquad (3)$$

which along with eq. (1) provides the time period of revolution, ' t ' of Boson or photon, $t = [H / (6\, h\, m\, g_{eff}^{\,2})]^{1/2}$ and the radius ' r ' , of the orbit in which movement takes place, becomes $r = [H / (6\pi\, h\, m\, g_{eff})]$. It reveals that the movement of Boson with very high speed is under the influence of magnetic field as well as Earth's gravitational field. Recently, experimental observation about the movement with high speed of mass less particles Boson have been made also at the European organization for Nuclear Research (CERN) in Switzerland, especially the much sought after Higgs Boson or " God Particle". It is also noticeable that in place of using above value of $\boldsymbol{\varepsilon_o}$, the use of de Broglie's radiating energy $E_\lambda = h^2 / 2\, m\, c^2\, t^2 = \boldsymbol{\varepsilon_o}$ (free from Earth's magnetic field and gravitational field) in eq. (3) along with eq. (1) provides the following form of Einstein's Photoelectric equation:

$$h\upsilon = E_{kinetic} + W_f \qquad (4)$$

where $E_{kinetic}$ denotes the kinetic energy of photo- electrons and W_f is a quantity like that of Work function.

It has been also observed in present study that in presence of Earth's magnetic field only (absence of the gravitational field) the dynamics of energy of photon radiating system through eq. (1) provides the energy value as twice the value of Earth's magnetic field. This is already known that the vertical component (V) of Earth's magnetic field at pole and the horizontal component (H) of Earth's magnetic field at equator follow the relationship , V = 2 H ; i.e., the value of magnetic intensity at poles (I_p) is twice of the magnetic intensity at the equator (I_{eq}) , i.e., $I_p = 2\, I_{eq}$. Present observation reflects such behaviour. Current theoretical studies described here may be useful to Geophysicists, rockets - sputnik scientists and those who study about the Terrestrial or Geomagnetism. It may also provide new insights in the studies of photo chemistry and evolution of Universe.