Elementary Permanent Ring Magnet Atomic Model
Atoms as magnetically coupled oscillators

Johann Marinsek marinsek@aon.at

Introduction

According to Plato's cave parable human observers cannot see directly the true reality but only its "shadows" projected on a wall in the cave. The shadows represent things. We must interpret the shadows. We cannot read directly in the book of nature. The shadows of the atoms are their spectra, their magnetic properties, ionization energies, decay processes…

The hydrogen atomic oscillator

We must decipher the phenomena. What are the real causes of the phenomena? The nuclear atomic model with extra nuclear electrons or standing waves is untenable. Stern, Gerlach, Rabi and others detected the magnetic properties of the atoms. This suggested one conjecture, namely that the atoms are made up of tiny magnets.

It is a conjecture of mine that the formation of hydrogen is due to magnetic coupling of the constituent's elementary ring magnets. The ring magnets are not solenoids but elementary permanent ring magnets. We do not know what is the nature of charge and magnetism. We can only use our knowledge of the effects of magnetism and charges. I assume that the hydrogen atom is an oscillator. This atomic oscillator is made up of four permanent elementary ring magnets.

There are two types of atoms: orthomagnetic atoms and paramagnetic atoms. Ortho-magnetic atoms posses an overall magnetic moment. In para-magnetic atoms the magnetic moments cancel out each other. I assume that H exists in two varieties, namely ortho-H and para-H. Both varieties have many degrees of freedom and therefore many vibration modes with the corresponding eigenfrequencies.
I speculate that doublet line spectra are caused by two different atomic structures, say by ortho- and paramagnetic structures.
Hydrogen is the building block of all elements. The formation of elements is due to magnetic coupling.

The atoms are coupled with the all-pervasive electromagnetic medium which vibrations we perceive as light. The formula $\nu = \nu_0 \left| 1/4 - 1/m^2 \right|$ for the Balmer series for example shows the forced vibrations of that medium. The Balmer or Rydberg formulas are empirical formulas but they may exhibit some characteristic physical structures of the coupled oscillators.

Objections to Ring Magnet Atomic Model

Magnetic moments of the proposed atomic model differ partly from the reported ones. Not all of the reported magnetic moments are directly measured ones. Partly they are calculated. This calculation is founded on quantum physics. Magnetic moments according to current theory is an issue of the article
Magnetic Moments of Atoms Not Due to Electron Spin.

Rydberg frequency formula shows a difference of frequencies that represents eigenfrequencies of two coupled oscillators.
Atomic spectra show a "quantum" structure. We interpret these quanta as frequencies. Atomic spectra may indicate some characteristics of atomic structures. But we must distinguish between the eigenfrequencies of the atom and the eigenfrequencies of an electromagnetic medium that transmits the oscillations of the atom.

Does the hydrogen spectrum indicate some features of the atomic structure? Indeed, physicists observed patterns or series of spectral lines of hydrogen. The spacing between adjacent lines shows a decrease with decreasing wavelength until it converges at a limit. For the lines in the visible region, Balmer found a law-like pattern. In 1890 Rydberg found an empirical formula that describes the series of all wavelengths known at that time.

Rydberg formula: $1/\lambda = R_H(1/n^2 - 1/m^2)$, where $\lambda =$ the wavelength, $R_H = 10973731.55\ cm^{-1}$ is the Rydberg constant for hydrogen and n, m are integers. For the Balmer series in the visible region the formula is as follows: $1/\lambda = R_H(1/4 - 1/m^2)$, m = 3, 4, 5, ... Because the velocity of light is: $\lambda\nu = c$ (ν being the frequency), we can rewrite the formula for frequencies:

$\nu = \nu_H \left| 1/4 - 1/m^2 \right|$, where ν_H is the hydrogen Rydberg frequency $3.289\ 10^{15}\ sec^{-1}$

The best image of the hydrogen spectral series presents a textbook [thost]. This image (below) shows that the spectral series patterns are analogous to the Raman series.