The Snake River N-Radiation Lab
www.srnrl.com
28376 Peckham Rd. Wilder, Id 83676

The Infilling of Electron Subshells by Orbital Doubling

In the last century there have been two sets of experiments which demonstrate that light-radiation emissions from matter can be controlled by an externally applied electromagnetic fields. Both sets of experiments are “anomalous science” with respect to conventional physics.

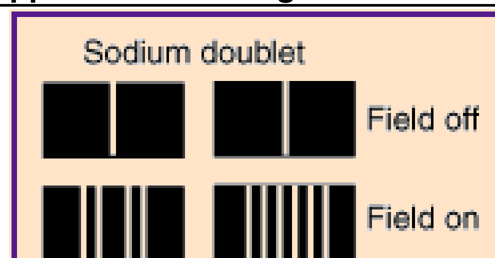
In 1896— fully three years before quantum physics was introduced by Planck’s Constant—the further splitting of the sodium spectrographic lines known as the “D-lines” by application of a magnetic field was reported by by Pieter Zeeman[1]. The “Zeeman Effect,” or the further splitting of spectrographic lines into doublets by application of an external magnetic field, was introduced as “anomalous science” to quantum physics[2].

Naturally-Occurring Sodium Spectrographic D-Lines[3]

(D-line change in eV)
$\Delta eV_{dbl} = \pm 0.0010659039$

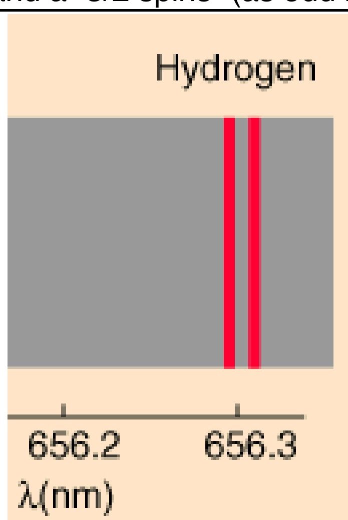
Doublets =(589.2937±0.2985) nm

Zeeman Splitting of Sodium D-Lines by Application of a Magnetic Field



doublets increased by “nesting”

A partial solution was agreed upon (but not proven experimentally) by the arbiters[4] of quantum mechanics. It was agreed that multiples of electron “1/ 2 spin” would be used to explain Zeeman spectrographic lines. It was proposed that the spin of the charged electron produced a magnetic moment which was influenced by the external magnetic field. This was a theoretical extension from a discovery in the hypersensitive spectrography of hydrogen. Hypersensitive spectrography had revealed natural doublets[5] in hydrogen emissions. The naturally occurring hyperfine doublets had been explained by differences between “1/2 spins” and a “3/2 spins” (as odd numbered multiples of 1/ 2 spin).



Hypersensitive Spectrography of Hydrogen Revealed Natural Light-Emission Doublets.

The “656.3 nm*” spectrographic line was found to be naturally composed of two hyperfine lines separated from “656.3” by “±0.016 nm.” This hyperfine separation of the 656.3 nm hydrogen spectrographic line is only about 5.4% of the separation found in the Sodium “D” lines. The variance in wavelength for the doublets calculates to a variance in electron voltage of ±0.000046 eV.

**This wavelength is identified as belonging to the “6h” subshell by the quantum-dimensional orbital model.*

1 See “http://hyperphysics.phy-astr.gsu.edu/Hbase/quantum/sodzee.html#c2”

2 *Deciphering the Cosmic Number,* A. I. Miller, W.W. Norton & Co., NY, NY. 2009. P.P. 95-96.

3 Source: daviddarling.info/encyclopedia/D/D_lines.html

4 Bohr, Schrodinger, Heisenberg, De Broglie and Pauli. Significantly, Planck was always excluded from the panel of official “experts.”

5 *Hydrogen Fine Structure ,* hyperphysics.phy-astr.gsu.edu/Hbase/quantum/hydfin.html#c1

There is absolutely no explanation from consensus quantum-mechanics as to how or why the doublets produced by the externally applied magnetic field are related to these naturally occurring light doublets. Quantum-mechanics proposes that the doublets are explained by the magnetic moment of spin within a field. But how does an externally applied magnetic field relate to some type of kindred field which must reside within the atom? If Zeeman Effect doublets are explained by spin within a field, the naturally occurring doublets must also be explained by spin within a field. Lacking adequate electromagnetic field descriptions for these related phenomena, the "agreed-upon" explanation of the Zeeman Effect still resides as "anomalous science."

The Zeeman Effect is removed from the category of "anomalous science" by the quantum-dimensional model of the electron orbital. The hyperfine structure of 656.3 nm hydrogen, the naturally occurring D-lines at "589.3±0.2985 nm," and the Zeeman Effect multiplication of these D-lines are explained by an electron voltage distribution into the electron shell/subshell structure, a distribution which is lacking in the quantum-mechanical model[6].

> ***Operational Principle:*** *The electron voltage of light emissions are the equivalent of the electron voltage of the orbital. Spectrography can identify orbital electron voltage.*

The Zeeman Effect multiplication of the original sodium doublet proves that doublets are added by nesting. A second doublet "nests" the original doublet. To add a third doublet requires that the first two be nested in and by the third. It will shortly be proved that doublets are caused by electron voltage pressure against the magnetic moment of electron spin. In order to add another doublet the electron voltage pressure must be doubled in order to facilitate nesting.

The quantum dimensional model provides an electron voltage distribution into the orbital shell/subshell structure from the periodic table of elements. This distribution demonstrates that a doubling of electrons voltage between subsequent subshells produces a systematic addition of doublets and, therefore, a systematic in-fill of electrons into the shell/subshell structure.

Table of Shell/Subshell Electron Voltages[7]

Shell number= n $eV = \frac{13.6033}{n^2}$	*Subshell negation number= n'* $\mathbf{eV} = \left(\frac{\mathbf{1}}{\mathbf{n^2}} - \frac{\mathbf{1}}{\mathbf{n'^2}}\right)\mathbf{13.6033}$ **From Rydberg Distribution**						
Shells Low=7 High=1 n; elec. Volts	subshells "s" n'=8 Cap.= 2 **elec.Vlt.**	subshells "p" n'=7 Cap.= 4 **elec.Vlt.**	subshells "d" n'=6 Cap.= 6 **elec.Vlt.**	subshells "f" n'=5 Cap.= 8 **elec.Vlt.**	subshells "g" n'=4 Cap.= 10 **elec.Vlt.**	subshells "h" n'=3 Cap.= 12 **elec.Vlt.**	subshells "i" n'=2 Cap.= 14 **elec.Vlt.**
n=1; 13.6033 eV	13.3907	13.3256	13.2254	13.0591	12.7531	12.0918	10.2025
n=2; 3.4001 eV	3.1883	3.1232	3.0229	2.8567	2.5506	1.8893	
n=3; 1.5115 eV	1.2989	1.2339	1.1336	0.9673	0.6613		
n=4; 0.8502 eV	0.6377	0.5726	0.4723	0.3061*			
n=5; 0.5441 eV	0.3316*	0.2665	0.1663	*An anomaly. The higher "4f " subshell (in Brackett shell) has less eV than the lower "5s" subshell (in Pfund shell).			
n=6; 0.3779 eV	0.1653	0.1003					
n=7; 0.2776 eV	0.0651						

A review of the table reveals that "shells[8] "vary by the number of "subshells" contained

---

[6] See *The Quantum Dimension;* Chapt. 1.

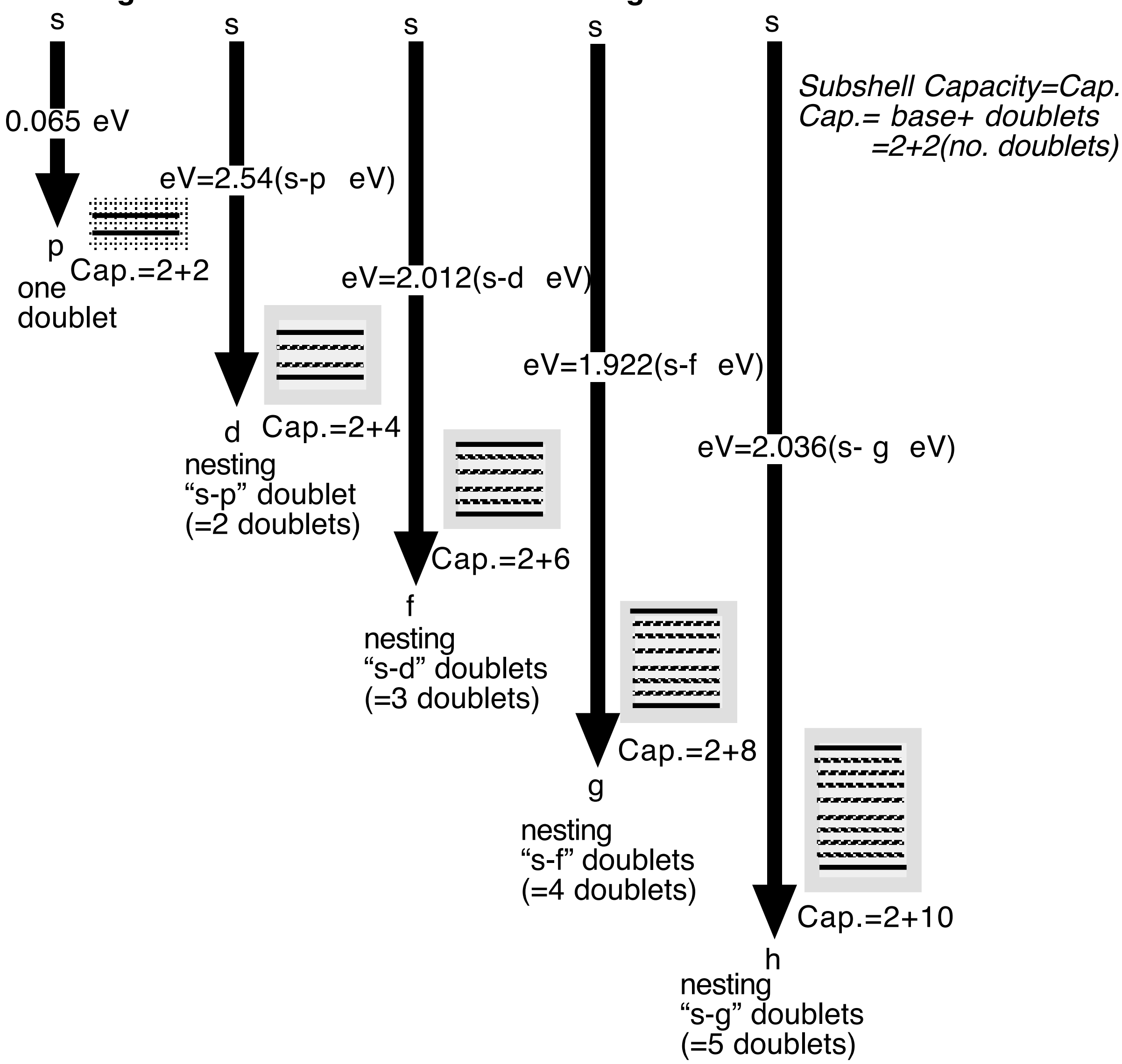
[7] Ibid.

[8] *A shell enumeration problem:* The table enumerates by energy, the highest and furthest being the "1" shell. The periodic table enumerates from the nucleus, the lowest energy and closest being the "1."

within them. The highest energy shell contains all “7” subshells. The lowest energy shell and the one closest to the nucleus contains only one subshell, the “s” which is present in all shells. Each shell contains a descending number of subshells (by the periodic-table standard). The “7 shell; n=1” contains all subshells. The next lower “6 shell; n=2” contains all but the “i” subshell. The next lower “5 shell; n=3” contains all but the “i” and the “h” subshells and so forth.

If one were to subtract the electron voltage for a “high” subshell from the electron voltage for a lower subshell within any shell, one would discover that the difference is always the same regardless of the shell chosen. The electron voltage across the shell to any specific subshell— that is, the accumulated electron voltage from the highest “s” subshell to that subshell— is the same for all shells containing the subshell. The doubling of this shell electron voltage for descending subshells explains why the “orbital doublet potential” for descending subshells increases by one doublet over the subshell above it. The nesting of the previous subshell’s doublets requires an approximate doubling of electron voltage to accomplish.

Doubling “eV” across Shells for Succeeding Subshells Solves Nested Doublets



The potential “nested doublet” orbits for any subshell determines the number of electrons that subshell can accommodate. Starting with the basic number of electrons as determined by the Pauli exclusion principle, electrons can be added to the "nested doublet" orbits as needed. The Paul exclusion principle provides that only two electrons can occupy the same orbital without causing interference with one another. The offset "nested doublet" orbits provide additional noninterference orbits for the subshell. Each leg of the doublet can accommodate an electron or two electrons can oscillate between the legs.

A single electron can oscillate between legs of an orbital doublet. This is proved by the hypersensitive light doublet[9] produced by hydrogen's single electron from the "6h" subshell (see illustration above). The oscillation between orbital legs is a "square wave" oscillation, not a "sine wave" oscillation, which requires the quantum dimension to adequately explain. A set of doublet orbitals which bracket the basic subshell orbital alternatively receive the electron. The alternation is not accomplished by crossing back and forth across the basic orbital since such crossings would interfere with the two electrons contained in the basic orbital.

Rather, this "square wave" oscillation is accomplished by adding and subtracting whole units of quantum space to the basic orbital. This is possible by the quantum geometric principles governing quantum-squared orbitals. A quantum is composed of only two points which are forcibly separated. The force sustaining the quantum-squared orbital is electron voltage. Quantum "spikes" in electron voltage produce new quantum distances instantaneously. The laws governing motion are not relevant to this addition and subtraction of quantum space.

This is proved by an exact formula for the change in electron voltage which produces the hydrogen orbital doublet shown above. It is a formula derived from the quantum dimensional model and only from the quantum dimensional model. It is completely lacking in quantum mechanics. The change in electron voltage establishing the doublet is shown to be a mathematical function of subshell electron voltage impacting the magnetic moment of the electron's 1/2 spin. Δ eV is shown to be an instantaneous electrodynamic force.

THE EXACT FORMULA FOR THE HYPERSENSITIVE DOUBLET

Calculation for Required ΔeV to Produce 656.3 nm Hyperfine Doublet

(Incorporating the Intra-Atomic Anomalous Magnetic Moment calculated by the the degrees of declination for the wave-phase planes in the orbital model.)

$$1/2\ spin\ eV = \frac{(t_\psi \mu_B)}{e} = eV_{(1/2)spn} = 1.1970188584 \quad 10^{-18}\ eV\ ;$$

$$\mu_B = \{Bohr\ Magneton\} = 9.2740091501e - 24\ \ joules\left(t^{-1}\right)$$

$$t_\psi = \{electron\ 1/2\ spin\ time\ constant\} = 2.0679691463e - 14\ \text{sec.}$$

$$\ddot{\gamma} = \{anomalous\ magenetic\ moment\} = 0.0530516477; \quad eV_{sub} = 1.8893472222\ eV$$

$$\frac{\Delta eV_{dbl}^4}{eV_{sub}^2} = (1+\ddot{\gamma})eV_{(1/2)spn} = (1.0530516477)\left(1.1970188584\ \ 10^{-18}\right) = 1.2605226812\ 10^{-18}\ eV$$

$$\pm\Delta eV_{dbl} = \sqrt[4]{eV_{sub}^2\left(1.2605226812\ 10^{-18}\ eV\right)} = 0.000046\ eV$$

Note: This calculated "$\pm\Delta eV_{dbl}$ =0.000046 eV" is equal to the measured spectrographic change in "eV" reported for the hypersensitive doublet .

[9] The electron voltage of a light emission is the equivalent of the electron voltage of the subshell producing that light emission. This is a fact which is firmly proved empirically even if it is contested by obsolete quantum-mechanics. See *The Quantum Dimension.*

The change in eV oscillates between "+" and "-" because of the pendulated 1/ 2 spin[10] of the electron. "Pendulated 1/ 2 spin" is unique to the quantum-squared orbital and is defined as a change in the direction of spin without a change in the direction of motion. The direction of spin against the electron-voltage field is changing every 2.068e-14 seconds, alternately providing an equal increase and decrease in electron voltage to establish the doublet.

The Zeeman Effect further splitting of the sodium D-lines shows that the "high" D-line produces three nested doublets and the "low" D-line produced two nested doublets. The single sodium electron producing the D-lines, when placed under an external magnetic field, is forced to oscillate between three doublets on the high side and two doublets on the low side, alternatively occupying a total of 10 different orbital positions. Understanding why this is so requires understanding why the D-lines might occur in the first place.

The sodium D-lines— wavelengths [(589.2937±0.2985) nm]— reside between the wavelengths of the "6g" subshell (486.1 nm) and the "6h" subshell (656.3 nm). The "6; n=2 shell" containing these subshells outputs visible light frequencies and is designated as the "Balmer shell." It is proposed that highly energized sodium attempts to move all eleven of its electrons, en mass, from the "6h" to the "6g" subshell. The "6g" cannot contain all eleven of these electrons because the number exceeds "6g" capacity by one electron. From the illustration above, the capacity of a "g" subshell is "2+2(4 doublets)=10 electrons." The excessive eleventh electron becomes "stuck" between the "6h" and the "6g" and spits into the D-line doublet.

But why should this occur? Why shouldn't the eleventh electron simply stay "fixed" in the lower "6h" subshell? The answer is that the "g" subshell— to which the excess electron is tending— is marginal in the electron voltage needed for doublet management. To nest the doublets of an adjacent subshell, any subsequently lower subshell must possess twice the shell electron-voltage of the adjacent subshell. From the illustration above it can be seen that the "g" subshell is the only doublet-containing subshell which is marginal on this requirement. The "g subshell's" shell electron-voltage is only 1.922 *times* the "f subshell's" shell electron-voltage. This 4% deficit in doublet-management electron voltage is also a deficiency in electron-voltage pressure against the subsequently lower "6h" subshell.

This deficiency in electron-voltage pressure makes the "6g" very unique in the shell/subshell structure. The "6g" is more receptive to electron in-fill from lower subshells than any other subshell in the structure. It provides less resistance to accepting additional electrons. It is this reduced resistance which explains the eleventh electron's attempt to enter the "6g" rather than staying "fixed" in the "6h." The sodium D-lines are explained by the reduced resistance characteristic of the "6g" subshell.

The Zeeman Effect— the multiplication of the sodium D-lines through doublets under stimulation from an externally applied magnetic field— is also explained by the unique characteristic of the "6g" subshell. A magnetic field is an induction field, that is, a field which initiates or multiplies voltage. The external application of a magnetic induction field controlled the shell electron-voltage of the "6g" subshell. The induction field multiplied the deficient electron-voltage, moving the "6g" out of the deficiency range. The natural subshell deficiency in resistance to electron intrusion was suddenly ended by an artificially induced field. A fully functional state of resistance was initiated in its place.

The newly functioning subshell resistance to intrusion from the "6g" now identified resistance from all ten electrons occupying the subshell. Electron voltage resistance from the whole of the subshell was converted to resistance from the individual occupants of the subshell. The

[10] See "*Table of Values..*" in the *Four Dimensional Atomic Structure Lab Manual* for pendulated 1/2 spin.

D-line doublet— representing resistance of the whole— became five nested doublets representing 10 different orbital positions. Thus, the full strength of a now sufficient electron-voltage required to establish the nested doublets in the "6g" was applied against the intruder.

The whole of the "6g" was represented by the original D-line doublet. This "whole" became five nested doublets. The increase in nested doublets under application of the external field is "four" (5-1=4). "Four" is exactly the number of nested doublets in the "6g" subshell (see illustration above). An externally applied induction magnetic field reproduced in the D-lines the exact nested doublet condition which existed in the "6g" subshell toward which the D-line electron was inclined. This condition occurred after the deficient electron voltage of the "6g" was induced to sufficiency by an external field.

The sodium D-lines have proven that an externally applied induction field can influence and control the light emissions from electrons by controlling subshell electron voltage.

The Control of Light Emissions by Externally-Applied Electromagnetic Fields

The quantum-dimensional model demonstrates that the sodium D-lines are caused by a deficiency in shell eV for the "6g" which prevents that subshell from "fixing" the eleventh sodium electron into a lower subshell. The requirement to "fix" an excess electron into a lower subshell had occurred after the "6g's" in-fill capacity had been reached.

The "Zeeman Effect" multiplication of the D-lines is demonstrated to be caused by a boost in this deficient "6g" electron voltage by an externally applied magnetic field. The magnetic field had operated as an induction field upon shell electron voltage, boosting the deficient electron voltage past the sufficiency threshold. This capacity of an externally applied electromagnetic field to control electron voltages within the atom directly controlled the light being output by orbital electron voltages. The two natural D-lines became 10 lines composing five doublets, each line outputting a change in frequencies over original D-line frequencies. These changes in frequency occurred under the application of an induction field.

The old, sodium "D-line" data has resided and continues to reside in science as an "anomalous anecdote." The anecdotal nature of it is revealed by the very title applied to control of sodium light emissions by application of an induction field. It is called the "Zeeman Effect." It is an unknown "effect," not the end result of recognized electrodynamics processes.

Without the quantum-dimensional model and its table of electron voltages for shells/subshells— a table built upon the premise that light-emission eV is the equivalent of orbital eV— the sodium D-lines could not be recognized for what they were. Neither could the multiplication of the D-lines under influence of an externally applied induction field be recognized for what it revealed. The so-called "Zeeman Effect" actually showed how subshells could accommodate greater numbers of electrons by the "nested doublet" process. A subsequent subshell could "nest" the doublets of a predecessor subshell— adding one more doublet in the process— if it had twice the shell electron voltage of the predecessor. The electron voltage table showed this doubling of electron voltage by descending subshells to be the case for every subshell except the "6g" which was slightly deficient at "1.922."

Lacking the quantum-dimensional model at the times of the discoveries of the sodium D-lines, the hypersensitive hydrogen doublets and the Zeeman Effect, science could not launch the field of inquiry those discoveries should have engendered. Science could not begin examining how the applications of electromagnetic fields could control internal nuclear and atomic processes. It would require the additional discovery of the mathematics governing the quantum dimension nearly a century later to make that launch possible.