SunQM-9s1: Updates and Corrections for the SunQM Series Articles (Part-1, Drafting Began in 2019)

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Abstract/Introduction

This is not a research article, but a collection of updates, corrections, terminology normalizations, and questions/answers (Q/A) for my 37 of SunQM series articles that have been posted at the preprint server viXra.org (from April 2018 to February 2025). The suggested reading sequence for these 37 posted SunQM series papers is: SunQM-1, 1s1, 1s2, 1s3, 2, 3, 3s1, 3s2, 3s6, 3s7, 3s8, 3s3, 3s9, 3s4, 3s10, 3s11, 4, 4s1, 4s2, 5, 5s1, 5s2, 7, 6, 6s1, 6s2, 6s3, 6s4, 6s5, 6s6, 6s7, 6s8, 6s10, 6s10, 6s11, 7s1, and 7s2. During my ~10 years (2014 ~ 2025) closed-door development on the {N,n} QM (through the "global energy minimization" kind of research), some of my early stage work lacks of consistency with the late stage work, and thus needs to be updated and corrected. Those important updates and corrections have mostly been presented in the late stage SunQM articles. The current paper includes the rest updates and corrections (that may be less important). The current paper (SunQM-9s1: Update … (part-1)) covers the updates for SunQM-1, 1s1, 1s2, 1s3, 2, 3, 3s1, 3s2, 3s6, 3s7, 3s8, 3s3, 3s9, 3s4, 3s10, 3s11, 4, 4s1, 4s2, 5, 5s1, and 5s2. The next paper (SunQM-9s2: Update … (part-2)) covers the updates for SunQM-7, 6, 6s1, 6s2, 6s3, 6s4, 6s5, 6s6, 6s7, 6s8, 6s10, 6s10, 6s11, 7s1, and 7s2.

Steve Wolfram once mentioned that he developed the online calculator "Wolfram Alpha" for the purpose of democratizing the math [citation at youtube video?]. After I discovered the Solar {N,n//6} QM structure and built a single master table of {N,n//6} QM structure for our universe (see SumQM-7's Table-1), I wish that the novel {N,n} QM also will democratize the QM theory. I also wish that the {N,n} QM (or any fragment of it) can be the useful building material for the scientific community to build the more completed QM.

Note: Because many recent QM text books used the name of "Modern Quantum Mechanics", in the SunQM articles, the "Modern QM" referred to the mainstream QM theory before 2016 that mainly used the matrix mechanics to describe QM. The "{N,n} QM" was developed since 2016 by mainly using the wave mechanics (that was enlighten by the newly discovered Solar system's {N,n//6} QM structure). In the SunQM series articles, the "traditional QM" means the mainstream "Modern QM", or the "matrix QM", that relative to the {N,n} QM.

Acknowledgements (for all articles in the SunQM series):

Many thanks to: all the (related) experimental scientists who produced the (related) experimental data, all the (related) theoretical scientists who generated all kinds of theories (that become the foundation of {N,n//q} QM theory), the (related) text book authors who wrote down all results into a systematic knowledge, the (related) popular science writers who simplified the complicated modern physics results into a easily understandable text, the (related) Wikipedia writers who presented the knowledge in a easily searchable/accessible way, the (related) online (video/animated) course writers/programmers who presented the abstract knowledge in an intuitive and visually understandable way. Also thanks to NASA and ESA for opening (and organizing) some basic scientific data to the public, so that citizen scientists (like me) can use it. Also thanks to the online preprinting serve vixra.org to let me to post out my original SunQM series research articles. Also thanks to the richness of the California state, and thanks to the high level of scientific research and the high level of the popular science education in USA, so that any civilized person in the world (with the good will) can use his own money (practically zero money) to do some studies on the theoretical physics (and using some free public resources).

Special thanks to: Fudan university, theoretical physics (class of 1978, and all teachers), it had made my quantum mechanics study (at the undergraduate level) become possible. Also thanks to Tsung-Dao Lee and Chen-Ning Yang, they made me to dream to be a theoretical physicist when I was eighteen. Also thanks to Shoucheng Zhang (张首晟, Physics Prof. at Stanford Univ., my classmate at Fudan Univ. in 1978) who had helped me to introduce the {N,n} QM theory to the scientific community in 2018.

Also thanks to a group of citizen scientists for the interesting, encouraging, inspiring, useful, and sometimes even amusing (online) discussions on the quantum mechanics:
"职老" (https://bbs.creaders.net/rainbow/bbsviewer.php?trd_id=1079728, "原创：宏微引力场兼并下的普朗克常数独立推算");
"mingcheng99" (https://bbs.creaders.net/tea/bbsviewer.php?trd_id=1384562, many educational posts on theoretical physics);
"zhf" (https://bbs.creaders.net/tea/bbsviewer.php?trd_id=1319754, "我与名校物理博士有关单粒子双缝实验的对话");
Yingtao Yang (https://bbs.creaders.net/education/bbsviewer.php?trd_id=1135143，一个加拿大"学术民科"的心声);
"tda" (https://bbs.creaders.net/education/bbsviewer.php?trd_id=1157045，"问一个量子力学物质波相速度的问题"), etc.

Also thanks to: Takahisa Okino (Correlation between Diffusion Equation and Schrödinger Equation. Journal of Modern Physics, 2013, 4, 612-615), Phil Scherrer (Prof. in Stanford University, who explained WSO data to me (in email, see SunQM-3s9)), Jing Chen (https://www.researchgate.net/publication/332351262_A_generalization_of_quantum_theory), etc.

Also thanks to my family members (especially my wife and my children), who supported me in many different ways during the past years. Also thanks to the "Yahoo Mail" whom provided me the free email account for many years (so that I can communicate with other scientists). Also thanks to UCSD library that opened to public so that I can read some text books over there. Note: if I missed anyone in the current acknowledgements, I will try to add them in the future (version-2025) acknowledgements.

Note: A series of SunQM articles that I am still working on:
SunQM-9s2: Updates and Corrections for the SunQM Series Articles (Part-2, Drafting Began in 2021)
SunQM-8: {N,n} QM and the condensed matter physics … (drafted in Jan. 2024).

Note: Major QM books, data sources, software that I used for the study (in the SunQM series articles):
Douglas C. Giancoli, Physics for Scientists & Engineers with Modern Physics, 4th ed. 2009.
David J. Griffiths, Introduction to Quantum Mechanics, 2nd ed., 2015.
Stephen T. Thornton & Andrew Rex, Modern Physics for Scientists and Engineers, 3rd ed. 2006.
John S. Townsend, A Modern Approach to Quantum Mechanics, 2nd ed., 2012. (Figure 9.11, Figure 10.5)
周世勋, 量子力学教程, (Shi-Xun Zhou, Quantum Mechanics Tutorial) 1979 edition.
Wikipedia at: https://en.wikipedia.org/wiki/

(Free) online math calculation software: WolframAlpha (https://www.wolframalpha.com/)
(Free) online spherical 3D plot software: MathStudio (http://mathstud.io/)
(Free) offline math calculation software: R
Microsoft Excel, Power Point, Word.
Public TV's space science related programs: PBS-NOVA, BBC-documentary, National Geographic-documentary, etc.
Journal: Scientific American.

Note: I am still looking for endorsers to post all my SunQM articles (including the future articles) to arXiv.org. Thank you in advance!

Note: So far, my identity (for the {N,n} QM development) is: a former lecturer of Fudan University, and a (10 years closed-door, 2014 ~ 2025) citizen scientist of California.

Note: With my 37 of SunQM research articles that have been posted out so far, I believe that the framework of the {N,n} QM has been fully established. It is clear now that the {N,n} QM description is suitable not only for the mass field, but also for the force field (or the energy field, or the "space density" field and/or a "space curvature" field as mentioned in SunQM-7s1, etc.). Thus, my 10 years of closed-door research phase (2014 ~ 2025) on the {N,n} QM is ended. After that, I will re-write the SunQM Articles (~37 of them) in form of a text book. The initial plan is, 1) Try to formally publish all ~37 of SunQM articles as the original version (version-1, or version-2018) if possible; 2) Using ~2 years, to brief (by re-writing) all ~37 of SunQM Articles (as version-2, or version-2025), the main purpose is to unify the nomenclature and the description, compress the total words from over 440,000 to less than 200,000, (and publish it if possible), make it ready for the text book writing; 3) Using 2 ~ 4 years, to write a Bohr-QM based {N,n} QM text book (with ~100,000 words, as version-3, for college and high-school students), formally publish it if possible, and may make a few online video lectures; 4) Using 2 ~ 4 years, to add Schrodinger-equation based {N,n} QM into the version-3 text book with final ~200,000 words (as version-4), formally publish it if possible, and may make a few online video lectures. It may take me total 6 ~10 years (2024 ~ 2035, semi-retired) to finish all the work. I may go back to Shanghai to do this work, either as a citizen scientist of Shanghai, or, if lucky, as a (semi-retired) professor in Fudan university. 自题：闭关自修渡劫生，参破天机悟空尘。四十年圆量子梦，八千里归吴越魂。

=== Updates and corrections for the (37 posted) SunQM series articles ===

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[1] SunQM-1: Quantum Mechanics of the Solar System In a {N,n//6} QM Structure.
http://vixra.org/pdf/1805.0102v2.pdf （originally submitted on 2018-05-03）

SunQM-1.update-1

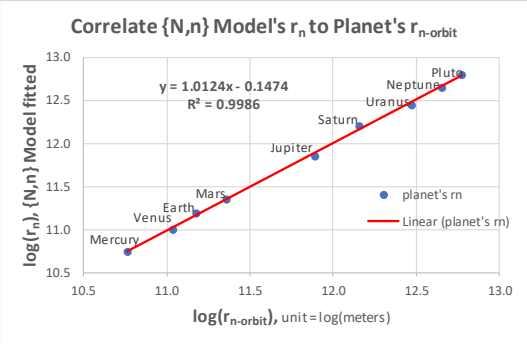
The hot-r is 1.26x of the cold-r. Because 1.26^3 = 2.0, the volume of the hot-r sphere $\left(V = \frac{4}{3}\pi r^3\right)$ is 2x of that of the cold-r.

SunQM-1.update-2

In {N,n//q} QM, the previously named "pFactor" now need to be changed tore-named as "qFactor", because p has been used in p{N,n} for a planet's {N,n} QM system under (and co-existed with) the Sun{N,n} QM system. Also |*nlm*> may need to be changed to |*qnlm*>.

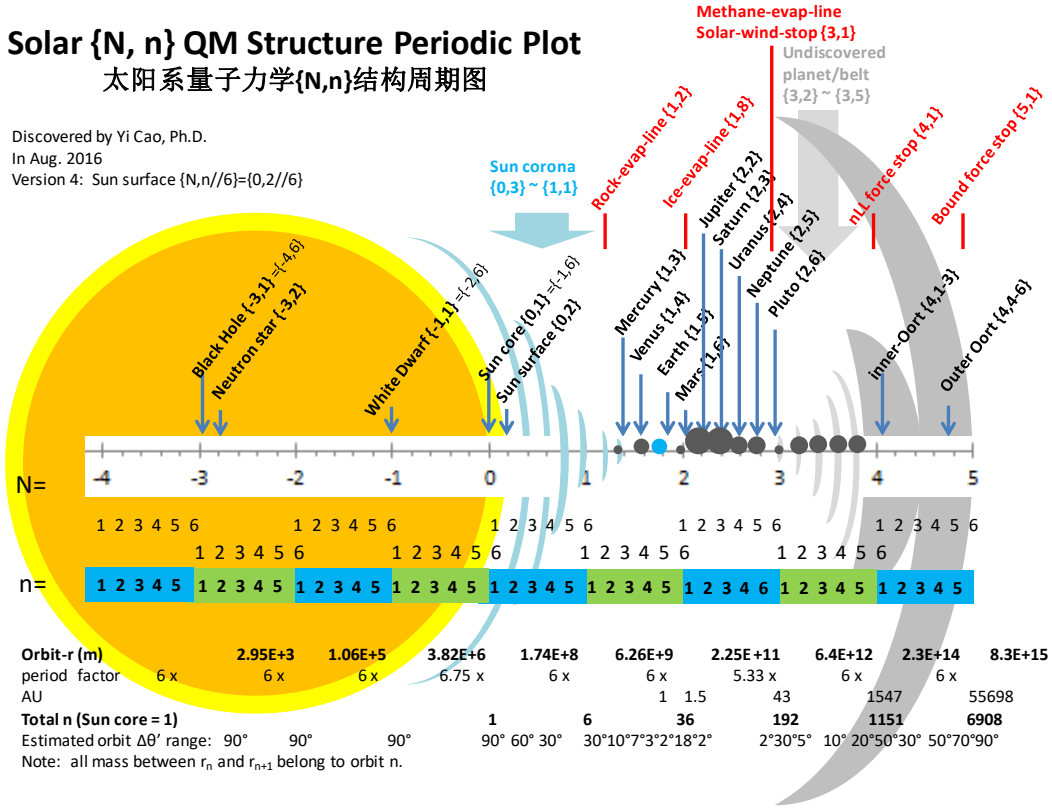
SunQM-1.update-3

For SunQM-1's Fig-1, use log-log plot to decrease the fitting error of the linear regression.



SunQM-1.update-4

For SunQM-1's Fig-2, use the latest version in SunQM-3s10's Fig-8.



SunQM-1.update-5

In section-VI-3, change it to be: "Some observed pulsars that we have assigned as neutron stars (i.e., a {-3,2} sized star with r ≈ 1.18E+4 m) may actually are {-2,1} sized QM structures (with r ≈ 1E+5 m), or the {-2,2} sized QM structures (with r ≈ 4E+5 m)". Reason for the change: see SunQM-7's section I-f "*A ground state {N,1//6} sized QM structure is often "accompanied" by a {N,2//6} sized (i.e., the first excited state {N,1//6}o orbital shell) QM structure*".

SunQM-1.update-6

"*depicts the atom as a small, positively charged nucleus surrounded by electrons that travel in circular orbits around the nucleus—similar in structure to the Solar System, but with attraction provided by electrostatic forces rather than gravity*" [1]. Citated wrong, should be [Wiki "Bohr model" 2017]

Add: So we may can say that the QM force may also be the primary force (besides the Newton force) for the formation of Solar system, especially for all planets' collective orbits.

SunQM-1.update-7

In SunQM-6s11, "*In {N,n//q} QM, planet Mercury's orbit is at {1,3//6} = {0,3*6//6} = {-1,3*6^2//6} = {2,(3/6)//6} QM state, with the base-frequency n = 3, or high-frequency n' = 3*6 =18, or 3*6^2 =108, etc., or sub-base-frequency n' = 3/6, etc.*". Note: {0,3*6//6} cannot be re-write as {0,3*6//6^2}, {-1,3*6^2//6} cannot be re-write as {-1,3*6^2//6^3}. See the detailed rule in "SunQM-5s2.update-4".

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[2] SunQM-1s1: The Dynamics of the Quantum Collapse (and Quantum Expansion) of Solar QM {N,n} Structure. http://vixra.org/pdf/1805.0117v1.pdf （submitted on 2018-05-04）

SunQM-1s1.update-1

The matter evaporated from inside the {1,n=1..5//6}o orbital shell space to {2,n=1..5//6}o orbital shell space (and captured mainly by Jupiter and some by Saturn) was mainly composed of H/He/NH_3/CH_4, etc., with some H_2O, even I said (in this paper) that it is driven by the "ice-evap-line". Also see "SunQM-3s6.update-2" for more detailed explanation.

SunQM-1s1.update-2

Hot-r tract has r = 1.26x of the cold-r, and causing the spherical volume = 1.26^3 =2x. Why volume increased to 2x? Because in {N=1,n=6..11}o shells space, the expansion of r has to cut r-distance quantumly. So among {N=1,n=6..11}o of 6 of n-shells, it has to cut-off the whole {1,11/6}o orbital shell completely (as a quanta). So now the outer edge of hot{1,10//6}o orbital shell space is at the cold{2,2//6} = cold{1,12//6} position, or Jupiter's current position.

SunQM-1s1.update-3

Misspelling: should be "explode", not "explore". In section-VIII, "part of its surface mass will explode outward". In section-X, "and its rock/ice-evap-line explodes as the super Nova".

SunQM-1s1.update-4

The experiment data have showed that the matter fragments of the inner Oort cloud have low inclination orbits while the outer Oort cloud have the high inclination orbits, suggesting that the matter in {3,n=2..5//6}o orbital shells should have higher chance to be planets rather than the low-inclination orbital belts.

SunQM-1s1.update-5

After being hit hard and lost ~50% mass, and the spin axis was forced to change ~90 degree, Uranus is still at the {2,4//6} orbit. This fact suggests that it is extremely difficult to make a planet to change its QM orbit-r value, probably due to that the integrity (or the holographic effect, or the "collective effect") of the Solar {N,n} QM structure strongly forced each planet to run at its QM orbit (collectively). This result disfavors the theory that the Jupiter was once moved away from its original orbit and went inward to accrete more mass, and then moved outward to the current orbit.

SunQM-1s1.update-6

"7-11 ball-torus gap effect" should be changed to "6-11 ball-torus gap effect". For < 1% mass occupancy, in the {N,n=1..5//6}o orbital spaces, all leftover mass accreted to the minimum r orbitals at {N,n=1..5//6}o, or, at n = 1, 2, 3, 4, and 5. Then, because the mass at {N,n=1//6}o orbital shell space is naturally sucked into the {N,n=1//6} sized ball, therefore, it looks like {N,1//6}o orbital space become empty, it becomes the "6-11 ball-torus gap effect". Also see SunQM-3s6.update-1.

SunQM-1s1.update-7

How to explain some other stars have "hot Jupiter" in the {1,n=1..5//6}o orbital region while our solar system has only terrestrial planets? This means that in our solar system, the H/He/NH_3/CH_4/H_2O atoms/molecules were evaporated before they become the primitive atmosphere of the {1,n//6} planets (because our Sun has a relative large mass and thus started H-fusion at relative early stage of the quantum collapse of the pre-Sun ball from (most likely in {2,1//6} state)), while those suns that has relative small mass would start H-fusion at relative later stage of the quantum collapse of the pre-Sun ball (most likely in {1,1//6} state?), so that it had enough time to let all H/He/NH_3/CH_4/H_2O atoms/molecules in {1,n=1..5//6}o orbital n shells to accreted to be the primitive atmosphere of the {1,n=2..5//6} primitive planets (so they become "hot Jupiter"). Once the primitive atmosphere of the {1,n=2..5//6} primitive planets is formed, it is much more difficult to evaporate it away from the "hot Jupiter" because the "hot Jupiter" has enough G-force to hold it (even the ice-evep-line has passed {1,6//6} later on). This can be seen that even the current ice-evep-line is expected at {1,9//6} and that has passed Earth's orbit {1,5//6}, the H_2O molecules in the ocean of Earth is not evaporated away from Earth, because Earth has enough G-force to hold it.

SunQM-1s1.update-8

The 26% radial increase (hot-r vs. cold-r) in Solar system's {N=-1..1,n=1..5//6}o orbital region not only supported the explanation that the (primitive) H/He/NH_3/CH_4/H_2O atoms/molecules within {1,n=1..5//6}o orbital shell of a {2,1//6} sized pre-Sun ball was evaporated outward, but also disfavors the (current mainstream) theory that the primitive Jupiter was first migrated inward (in the {2,1//6}o orbital range to pick up matter) and then migrated outward to the current {2,2//6} orbit (see one of the KPBS/NOVA TV program).

SunQM-1s1.update-9

Thanks KPBS/NOVA TV program (in the early 2000?) showed me the knowledge of that "*the annual growth rings of a tree trunk recorded the climate history of that tree growth even thousands years ago*".

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[3] SunQM-1s2: Comparing to Other Star-planet Systems, Our Solar System Has a Nearly Perfect {N,n//6} QM Structure. http://vixra.org/pdf/1805.0118v1.pdf （submitted on 2018-05-04）

SunQM-1s2.update-1

In Table 1, the last column should be removed. Check SunQM-7's Table-5 for the better description.

SunQM-1s2.update-2

The outside fly-in seed will bring the relatively large angular momentum for a new-forming star, while the in-situ seed will have relatively small angular momentum for a new-forming star.

SunQM-1s2.update-3

Discard Table 2, and use SunQM-5's Table-1 instead. Also use SunQM-7's Table-1.

SunQM-1s2.update-4

1st generation (or early) galaxies, small and round shape, no spiral, due to they were formed by in situ collapse, not by a flied-in seed, so they do not have (high) angular momentum, can't form spiral. The later generation of galaxies use the old galaxy as seed, so an old galaxy mass fly into a new nebula, (or two old galaxies merged into one through the binary orbit motion), and produced an angular momentum relative to the new mass center. So the new generation of galaxies can have spiral, and of cause, they are usually bigger than those without spirals. Also see SunQM-6s8's Fig-10 for spiral-arm forming mechanism for a galaxy.

SunQM-1s2.update-5

The {N,n//2} is the base of {N,n//q} QM structure. Then it becomes a base structure for building the next larger {N,n//2} QM structure by adding more mass, so it become {N,n//2} followed by {N,n//2}QM structure, the total is still a {N,n//2} QM structure. Then why we have {N,n//6}? This is because at first it was a {N,n//2} QM structure, then after adding more mass, it increased to a {N,n//3} QM structure (like Saturn), and this {N,n//3} QM structure is also a relative stable QM structure. Then it becomes a new base structure to build the next larger {N,n//2} QM structure by adding more mass, so the total is a {N,n//3} followed by a {N,n//2}, or q = 3 times q = 2 equals q = 6, or it becomes a {N,n//6} QM structure. Also see the same discussion in SunQM-6s10's section-VII.

SunQM-1s2.update-6

I heard the "orphan Jupiter" from one paper on the Scientific American (in early 2000?). Thank this journal for the popular science education.

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[4] SunQM-1s3: Applying {N,n} QM Structure Analysis to Planets Using Exterior and Interior {N,n} QM.
http://vixra.org/pdf/1805.0123v1.pdf （submitted on 2018-05-06）

SunQM-1s3.update-1

Saturn's moon Mimas has mass = 4E+19 kg, has oval shape, moon Enceladus has mass = 1.1E+20 kg, but has spherical shape. So the critic point of mass for using {N,n} QM may be at around 1E+20 kg, where the shape of the body can be naturally re-shaped by G-force to be spherical. Most likely that before a celestial body is massive enough to re-shape as a sphere, it is governed by G-force and chemical bond force. After a celestial body is massive enough to re-shape as a sphere, it is governed by G-force and QM force. Or {N,n} QM force not only causes the planetary differentiation (as seen in paper SunQM-3s6 through SunQM-3s8), but also (together with G-force) causes celestial body to be spherical shape. While the chemical bond force (and Van der Waals force, etc.) is the cause for the irregular shape (like a human body, a table, etc.).

SunQM-1s3.update-2

A doughnut-shaped mass of rock vapor—a synestia—in which the moon forms, is predicted to have r = 4x (or 9x, or 16x) of Earth's surface r (according to Earth's p{N,n//2} QM structure model). Following paper supported this saying. Simon J. Lock, & Sarah T. Stewart, "Origin story. an entirely new class of astronomical object--a synestia--may be the key to solving the lingering mysteries of lunar origin" Scientific American, July 2019, pp68. Also see SunQM-6s10's Appendix-F "Using {N,n} QM to determine the extra-stable orbits for an artificial Earth satellite".

SunQM-1s3.update-3

For Table-1 through Table-8, many orbit-r (in column 2) are actually the body-r of the planet (cores and shells).

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SunQM-1s3.update-4

Change the word "original planet" into the "primitive planet".

SunQM-1s3.update-5

In Table-9, I should have used Neptune's mass density 1638 kg/m^3 for all eight primitive planets to reconstitute the primitive planets. Planet Mars should be excluded from Table-9. So, the final primitive planets' $r_{EarthCore}$, r_{Earth}, $r_{atmosphere}$ for all planets (except Mars) are listed in the SunQM-3s6's Table-2. And, it will be (or it has been) used in many (further) calculations in the SunQM series articles.

SunQM-1s3.update-6

Not only all planets have the {N,n//2} QM structure, but Sun can also be treated to have a {N,n//2} QM structure: from the {-1,3//6} size, to {-1,6//6} = {0,1//6} size, to {0,2//6} size.

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[5] SunQM-2: Expanding QM From Micro-world to Macro-world: General Planck Constant, H-C unit, H-quasi-Constant, and the Meaning of QM. http://vixra.org/pdf/1805.0141v1.pdf （submitted on 2018-05-07）

SunQM-2.update-1

In section-1-c, eq-3, $E_n = -Hmf_n$, the f_n means the phase wave's $f_{n,ph}$. So, it better be written as $E_n = -Hmf_{n,ph}$. Also in Table-1, Table-2, and Table-3, all f_n should be written as $f_{n,ph}$.

SunQM-2.update-2

In SunQM-2, "Top-down view" vs. "bottom-up view" means to emphasize the "global fitting" more than the "local fitting", or, to emphasize the "completeness" more than the "self-consistency", or, to emphasize the "multi Eigen description" more than the "single Eigen description", or to emphasize the "holographic effect" more than the "non-holographic effect" …

SunQM-2.update-3

1) When RF at 100%, it provides a strong sustaining force to prevent further collapse in r-dimension. Therefore, the n=1 QM structure is the ground state, is the most stable state, will not further collapse.

2) A free electron plane wave, trapped into a "closed space" circular orbit, from high n to low n, ($n=2\pi rn/\lambda n$), it will increase RF. Why this happens? Consider a fixed wavelength matter wave, when it runs at r_n space with high n, it has a relative short wavelength, so it propagates in straight pathway. When it runs at r_n space with low n, it has a relative long wavelength, so it propagates in curved pathway. (Also see SunQM-7s1's section-I-d: Dynamic space transformation (part-2): "*Opened-space" vs. "Closed-space", and section-I-e: Dynamic space transformation (part-3): "straight-space" vs. "curved-space*").

3) At high n 's r_n space, an object can have relative more kinetic energy (KE) in r-dimension, but at low n's r_n space, an object has to have relative more KE in θφ-dimension?

SunQM-2.update-4

In a point centered (gravitational or electromagnetic) force formed {N,n//q} QM structure, H×n = constant may be one kind of uncertainty principle. Like that in SunQM-3s10's section-III, a r_n orbit can be described by either a small r_1 with the high n, or a large r_1 with low n, which may contain an uncertainty principle kind relationship: the smaller the r_1, the higher the n it can describe, or $r_1 * n\text{^}2 = r_n$ where r_n is a fixed value. Because $H = h/m' = 2\pi * \text{sqrt}(GMr_1)$ or $H \propto \text{sqrt}(r_1)$, so H×n = constant means $\text{srqt}(r_1) * n$ = constant, or $r_1 * n\text{^}2$ = constant^2, (and it is the Bohr formula $r_n = r_1 * n\text{^}2$).

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[6] SunQM-3: Solving Schrodinger Equation for Solar Quantum Mechanics {N,n} Structure.
http://vixra.org/pdf/1805.0160v1.pdf （submitted on 2018-05-06）

SunQM-3.update-1

On page 4, should be "*The time independent form in spherical coordinates* (p133, eq-4.14) …". On page 7, should be "*from Davis J Griffiths 's book "Introduction to Quantum mechanics", 2nd ed. 2005*. p154, Table 4.7,"

SunQM-3.update-2

I deduced R(6,5) myself according the same website: R(6,5) = 1 /12960/81 *SQRT(77) / [a^(3/2)] *(2/6*r/a)^5 *exp(-r/6/a). The original one missed 1/81.

SunQM-3.update-3

The Figure 1b and 1c may (or may not) be right. However, due to that the mass in the inside of the shell is 1000x times greater than that on the shell and that outside of shell, so even if this not right, it will not significantly affect the final result.

SunQM-3.update-4 (only for myself)

SunQM-3s11, section VI

Solving Schrodinger equation for a single (nonrelativistic) particle that moving orbitally around a central attractive force (valid for both H-atom and pre-Sun ball models) gives the eigenstates of this equation

$\Psi(r,\theta,\varphi,t) = R(r) * \Theta(\theta) * \Phi(\varphi) * T(t)$

The last two factors of ψ are often grouped together as spherical harmonics

$\Theta(\theta) * \Phi(\varphi) = Y(l,m)$.

The solution of Y(l,m) is valid for both outside the current Sun, as well as inside the current Sun and pre-Sun ball. The R(r) for H-atom (ignoring the normalization coefficient) is valid for outside the current Sun, but for inside the current Sun or a pre-Sun ball, there is significant deviation (due to that the center mass of the gravity potential V(r) inside Sun is also dependent on r). For example, if inside the Sun, the center Mass may can be simplified to have a M ∝ r^b (where 0 > b < 1) relationship, then the G-potential

V(r) = ∫ F dr∝∫ GM(r^b)m /r^2 dr = GMm ∫ 1/r^(2-b) dr = -GMm /r^(1-b) / (1-b) + cnst

If b=0, then it goes back to V(r) = -GMm /r + cnst.

For inside the Sun, I guess b is at around 0.5, so V(r) ∝ -2 GMm /r^(0.5) + cnst. So we need to solve the Schrodinger equation for inside the current Sun with V(r) ∝ -2 GMm /r^(0.5) + cnst., instead of V(r) = -GMm /r, to get an accurate R(r). As a citizen scientist leveled QM physicist, I don't have the ability to do that.

However, I guessed that the curve shape of the inside Sun's true R(r) is very similar as that of H-atom's R(r).

For this reason, in the SunQM series Articles, I used H-atom's R(r) to mimic inside Sun's (or planet's) radial wave function with two minor modifications:

1) In H-atom's R(r) formula, the Bohr radius a_0 is replaced by Sun or planet's r_1;

2) When plotting the R(r) curve vs. r, at the outside of Sun (or planet) surface, the r is logmically compressed with the formula: r (r > b) = b + log(r -b), where b = $r_{surface}$. (Also see SunQM-6s9.update-2's Figure-e).

I need to emphasis that this correction is only needed for inside Sun (or planet) region's R(r), it is not needed for the outside Sun's region where the H-atom's R(r) formula is fine (except need to re-normalize).

Then normalization factor of R(n,*l*) need to be re-calculated. SunQM-3s8, figure 1, Note-1: if use r_1 = 0.174 (with unit of 1E+9 m), then maximum Probability = 3.11. If use r_1 = 1.74E+8 (with unit of meter), then maximum Probability = 3.11E-9. E-9 probability is due to this R(n,*l*) is normalized for $r_1 = a_0$ = 5.29E-11 m. So when using this probability, I need to scale it up by ~1E+9 times to make it around to 1. We can avoid this trouble by deducing out the radial wave function R(n,*l*) that specifically normalized for Sun's r_1 =1.74E+8 m. But I am only a citizen scientist of QM, it is too much work for me to do that.

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[7] SunQM-3s1: Using 1st Order Spin-perturbation to Solve Schrodinger Equation for nLL Effect and Pre-Sun Ball's Disk-lyzation. http://vixra.org/pdf/1805.0078v1.pdf （submitted on 2018-05-02）

SunQM-3s1.update-1

The word "Disk-lyzation" means the disk-forming process from a spherical shape to a disk shape.

For the same pre-Sun ball, a disk-lyzation process is a nLL effect evolution process that from the low n (or the base-frequency n) to high n' (in θ-1D), this is very similar as the Y*l*m cycle process that also from the low n (or the base-frequency n) to high n'. Also see SunQM-6s11's Appendix-B-2 "*Does the Ylm cycle progresses always from low n to higher n'?*". The calculation result shows that the faster the star spinning, the larger and thinner the disk will be.

SunQM-3s1.update-2

Figure 2 (left), x, y, z coordinate marker, should be x, -y, z.

SunQM-3s1.update-3

In page 7, in eq-12 and after, the object mass *m* should use italic, and plane m is only for the quantum number m.

SunQM-3s1.update-4

In page 6, after eq-12, "*Note: to double check the sign of V_θ : just like that moving to the source (direction) of F_g will get lower V_g , here moving to the source (direction) of F_θ will get lower V_θ, so V_θ has the right sign*".
Also, in page 17, after eq-39, "*Now let us check the sign of $V_{cntfugl\text{-}r}$: just like that moving to the source (direction) of F_g will get lower V_g , here moving to the source (direction) of $F_{cntfgl\text{-}r}$ (always point away from spin axis) will get higher $V_{cntfugl\text{-}r}$, so $V_{cntfugl\text{-}r}$ has the wrong sign!*"

SunQM-3s1.update-5

According to the spherical 3D wave packet theory that developed in {N,n} QM field theory (in SunQM-6 series), the Solar system is a mass field spherical 3D wave packet, with the core at {0,2//6}, and with the inner, middle, outer spherical shell at N super-shell of {N=0..4,n=1..5//6}o orbital shell, and with the outmost shell of the spherical 3D wave packet at the {5,n=1..5//6}o orbital shell (i.e., the G-force's unbound super shell with N=5). Therefore, all objects in this {5,n=1..5//6}o unbound shell space can be treated as the outmost shell of the spherical 3D wave packet that is spinning-off from the "mother" 3D wave packet, and as a low-f "newborn".

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[8] SunQM-3s2: Using {N,n} QM Model to Calculate Out the Snapshot Pictures of a Gradually Disk-lyzing Pre-Sun Ball. http://vixra.org/pdf/1804.0491v1.pdf （submitted on 2018-04-30）

SunQM-3s2.update-1

The calculation result shows that the thinner the disk is, the more mature state for a star (or a galaxy) would be (in its evolution process).

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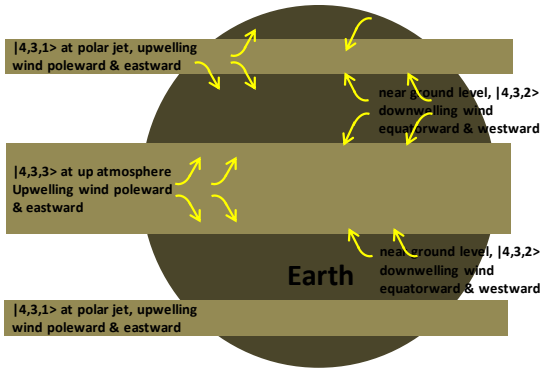
[9] SunQM-3s3: Using QM Calculation to Explain the Atmosphere Band Pattern on Jupiter (and Earth, Saturn, Sun)'s Surface. http://vixra.org/pdf/1805.0040v1.pdf （submitted on 2018-05-01）

SunQM-3s3.update-1

Figure 9b should be corrected as below. (So at the north hemisphere, the upwelling wind has the counter-clock direction because the equator zonal band has the faster eastward wind speed. This causes the north hemisphere's hurricanes/Taifengs always counter-clock-wise. See also SunQM-3s9's Figure 4a for the counter-clock wind in the northern hemisphere, and see SunQM-6s11's Fig-4 for re-assigning the |4,3,1> QM state to the polar jet).



SunQM-3s3.update-2

Unsolved Problem: When the inner ω_n mass (or particle) moves to outer ω_{n+x}, the angular momentum conservation will make ω_{n+x} slower, then why Jupiter's oozed out |544> band still keeps the relative faster angular momentum? See the answer in SunQM-6s11's section-II.

SunQM-3s3.update-3

Figure 4, don't need to change |400> shell to |4,0,m> shell. Because |400> or, Y(0,0) is valid. But why it is opposite of the explanation in the atom's electron configuration: 1s, 2s, 2p, 3s, 3p, 4s, 3d, … ? See the answer in SunQM-6's section-II "*The same (major) residue nLL QM state caused positive precession may also be the origin of the fast-flow zonal bands on Jupiter (and Saturn, Earth, Sun) atmosphere surface*".

SunQM-3s3.update-4

In abstract: should be "|5,4,m> zonal bands embedded in the background |400> QM state ball,", not only the "|544> zonal bands embedded in the background |400> belt bands"

SunQM-3s3.update-5

In SunQM-3s4, Jupiter's outer ring can be best described in a {N,4//3} structure with q = 3, same as that of Saturn's outer ring. Hence, Jupiter is said to have a superposition of {N,n//5} QM state with {N,n//3} QM state. Here I add one more evidence for Jupiter's q=5 and q=3 superposition: comparing to Saturn's q=3 structure (in Figure 7a), Jupiter's q=5 QM structure (in Figure 3c) can also be approximated as the q=3 QM structure, with the residue |5,4,4> zonal band equivalents to the residue |3,2,2> band, and with the combined residue |5,4,3>, |5,4,2>, and |5,4,1> bands equivalent to the residue |3,2,1> band.

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[10] SunQM-3s6: Predict Mass Density r-Distribution for Earth and Other Rocky Planets Based on {N,n} QM Probability Distribution. http://vixra.org/pdf/1808.0639v1.pdf (submitted on 2018-08-29)

SunQM-3s6.update-1

In one KPBS/NOVA TV program "Jupiter" (citation?), it used Jupiter's inward migration to clear out the mass in {1,n=6..11/6}o orbit shell space, and to explain the small Mars. However, in my solar {N,n} QM model, this is caused by the "7-11 ball-torus gap effect". Actually, it should be called "6-11 ball-torus gap effect". The small amount Mars' mass is due to the all {1,6}o orbit shell mass cleared out by the "6-11 ball-torus gap effect". Here is the detailed explanation: at the out edge of {1,5//6}o orbit shell, there was small amount of mass in |n*l*m> = |6,5,5> QM mode, and it was structured as one (or several) zonal belt(s) that embedded on the surface of {1,5//6}o orbit shell (see the similar structure in Figure 4 of SunQM-

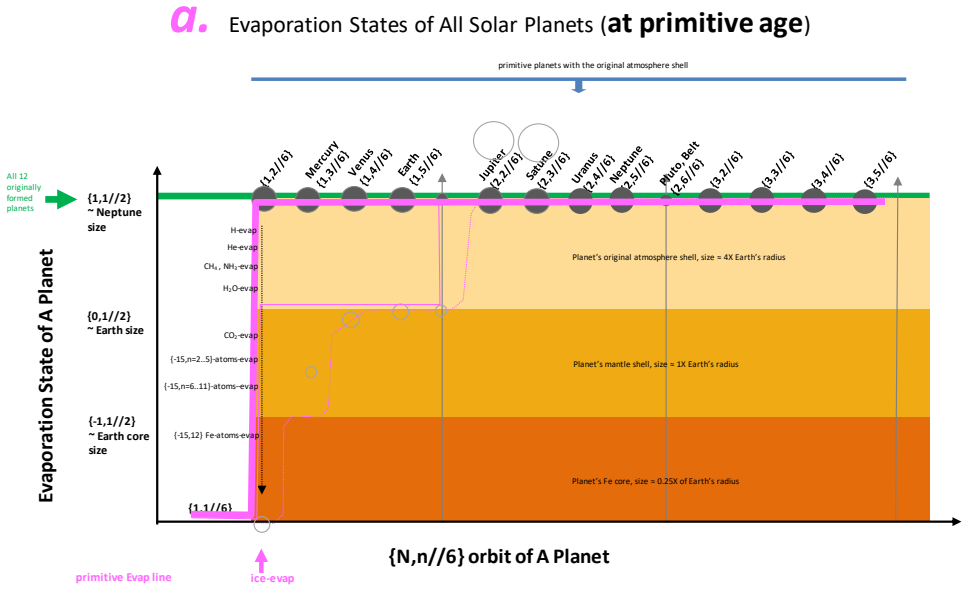
3s3, where a |5,4,4> mode is embedded on Jupiter {0,4//5}o orbit shell's |4,0,0> surface). After the pre-Sun's {N=1,n=1..5}o super shell collapse, this small amount of |6,5,5> mode mass was retained at {1,6//6}o orbit and eventually formed a small massed Mars. So, the saying that "*Mars at that time could have an ocean as deep as over (6.19E+6 - 3.48E+6) ≈ 2710 km on its surface*" is not correct.

SunQM-3s6.update-2

The chemical composition of all eight (or twelve) primitive planets (using the Earth-size as p{0,1//2} size): First, their primitive atmospheres (from p{1,1//2} to p{0,1//2}) are made of the period-1 (H, He) and the period-2 (C, N, O, …) of elements in the chemical periodic table, including the derivatives of the single atom of the period-2 element (like CH_4, NH_3, OH_2, etc., but not CO_2, nor O_2, etc.); Second, their "Earth-mantle-like" shells (from p{0,1//2} to p{-1,1//2}) are made of the element from period-1, period-2 and period-3 (including the derivatives); Third, their cores (within p{-1,1//2}) are made of the Z ≥ 26 elements. Therefore, for a primitive planet (with the primitive atmosphere), the first burning-off matter is the period-1 atoms like H and He, then the period-2 atoms including O, C, .. (as H_2O), then (as CO_2), …, then Mg, … .

As a former biophysicist, I think the chemical pH titration curve is a good way to present the shift of the (rock, ice, methane …) evaporation state for all 12 planets.

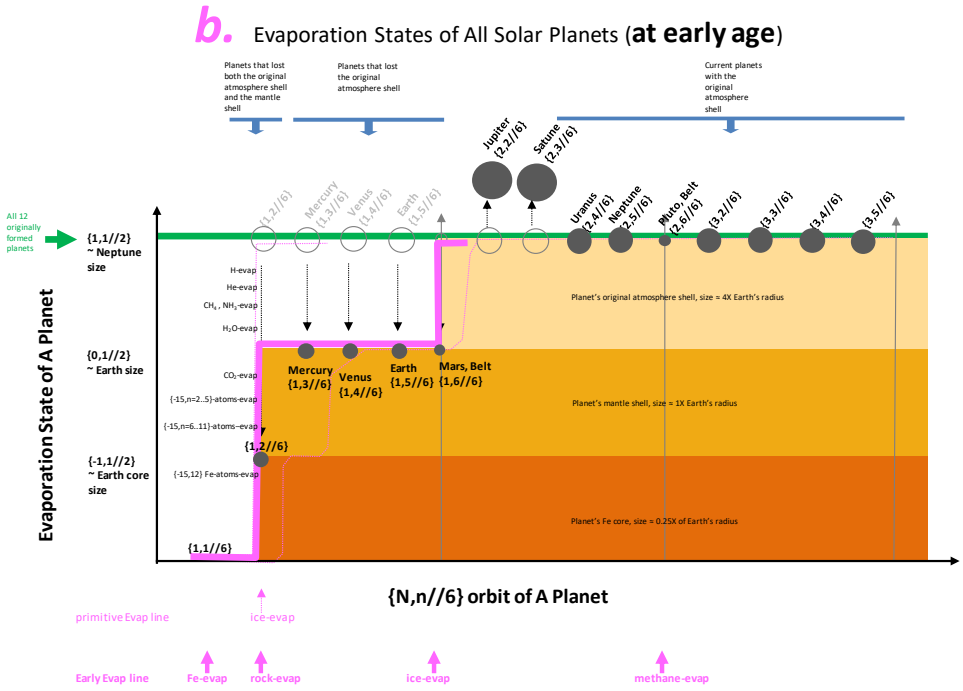
The Figure-a below illustrated that the 12 primitive planets were formed like the Neptune (that with the primitive atmosphere at p{1,1//2} size, an Earth-sized core at p{0,1//2} size, and an Earth-core-sized iron-core at p{-1,1//2} size), if all 12 planets accretion finished before the Sun's H-fusion ball expanded to {0,1//6} size and the ice-evap line did not expanded to larger than {1,1//6}.

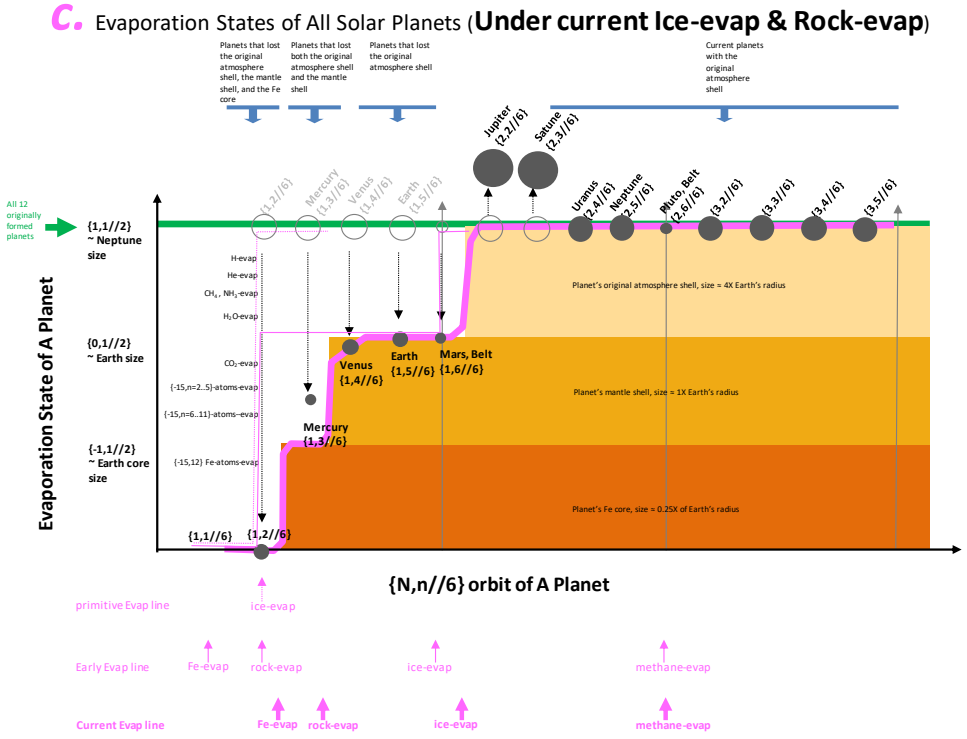


The Figure-b below illustrated that when Sun had its H-fusion expanded to the size of {0,1//6}, the Fe-evap line might already expand to the position at {1,2//6}, the rock-evap line might already expand beyond {1,2//6}, and the ice-evap line might already expand to the position at {1,6//6}, while the {1,n=2..6//6} planets were still doing the accretion. In this case, {1,n=3..6//6} planets were accreted as a terrestrial planet like Earth (that without the primitive atmosphere, only with an Earth-sized core at p{0,1//2} size, and an Earth-core-sized iron-core at p{-1,1//2} size). The {1,2//6} planet had its "Earth-mantle" shell evaporated completely, and may have its Fe-core evaporated (either completely or partly).

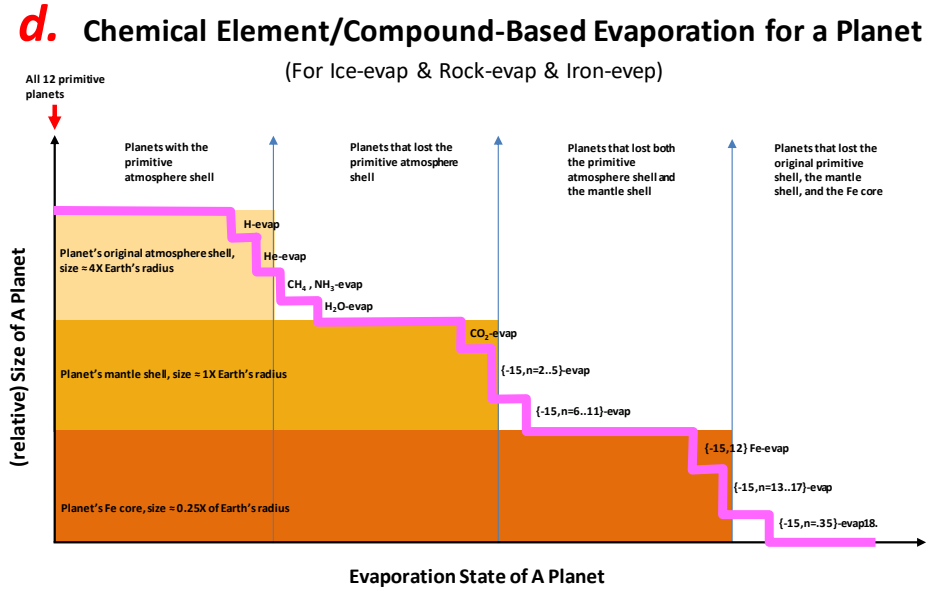
The Figure-c below illustrated that after Sun's H-fusion had expanded to the size of {0,1//6} while the planets were still accreting, and then the ice-evap line continued expanding to today's position at somewhere near {1,9//6}. Notice that Mercury is currently not in a stable QM state, it is (slowly) de-exciting for the previous stable QM state p{0,1//6} at the Earth-size to the next stable QM state p{-1,1//6} at the Earth-core-size. Also see SunQM-6s8's Appendix-C "*How to explain*

some other stars have "hot Jupiter" in the {1,n=1..5//6}o orbital shell region while our solar system has only terrestrial planets?".





The Figure-d below illustrated that the chemical element-based (or chemical compound-based) evaporation for a planet. The small atomic number (or the lighter) element/compound evaporate first. Also see SunQM-6s5's Appendix-*i*: *One more example for the "|nL0> Elliptical/Parabolic/Hyperbolic Orbital Transition Model"*. Also see SunQM-6s10's Appendix-E: *Two ways to explain the quantum (or major) rip off vs. the continues (or minor) rip off the surface matter of the planet Mercury*".



SunQM-3s6.update-3

J. Stephenson et al. recently found a new inner-inner core with r = 650 km. (*J. Stephenson et al. Evidence for the innermost inner Core: robust parameter search for radially varying anisotropy using the neighborhood algorithm. J. of Geophysical research: solid Earth. 12/02/2020*). Then my calculation of r = 400 km must be the initial {-1,1//4} QM state. As Earth core is cooling down and become more solidified, its inner-inner core size may increase 1 mm per year (wiki citation? I saw somewhere has this 1 mm, but can't find it anymore), so 650 km – 400 km = 250 km may imply that the inner-inner core start to cooling down at 250 mya.

Note: During my 10 years closed-door {N,n} QM research, usually I don't read (and even don't search for) the formal scientific articles (that may relate to my QM study) that published recently (i.e., after 2016), However, for time-killing, I often read the website (in Chinese) at, http://bbs.creaders.net/education/, or bbs.creaders.net/tea/, or bbs.creaders.net/rainbow/. Thanks the website http://bbs.creaders.net/ mentioned J. Stephenson (et al)'s recent result, and I happened to see it, and thus I used it here to support my study result.

SunQM-3s6.update-4

From the website (in Chinese) at, http://bbs.creaders.net/, I saw that in Dec 2021, a Science paper (*Kristine Lam, et al., "GJ 367b: A dense, ultrashort-period sub-Earth planet transiting a nearby red dwarf star" December 2021. Science 374(6572):1271-1275*). It found an exoplanet that made of almost pure Fe. I believed that it must be a Mercury-equivalent planet, but with all of its mantle evaporated. Also see SunQM-7's Appendix-D Example-4.

Note: During my 10 years closed-door {N,n} QM research, usually I don't read (and even don't search for) the formal scientific articles (that may relate to my QM study) that published recently (i.e., after 2016), However, for time-killing, I often read the website (in Chinese) at, http://bbs.creaders.net/education/, or bbs.creaders.net/tea/, or

bbs.creaders.net/rainbow/. Thanks the website http://bbs.creaders.net/ mentioned Kristine Lam (et al)'s recent result, and I happened to see it, and thus I used it here to support my study result.

SunQM-3s6.update-5

See SunQM-3s11's section I-b "*A major correction for inside Sun's (or inside planet's, or inside pre-Sun ball's) radial wave function R(r)*".

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[11] SunQM-3s7: Predict Mass Density r-Distribution for Gas/Ice Planets Based On {N,n} QM Probability Distribution. http://vixra.org/pdf/1812.0302v2.pdf (replaced on 2019-03-08)

SunQM-3s7.update-1

Another example of |qnlm> superposition is that, in Solar {N,n//6} QM structure, the n=6 orbital shell also shows n=1 orbital shell's higher RF phenomenon, so that n=6's RF is higher than that of its neighboring shells at either n=5 of {N,5//6}o or n=12 of {N+1,2//6}o. For example, see in SunQM-1.update-1's figure, Mars and Asteroid belt in {2,1//6}o = {1,n=6..11//6}o orbital shell has the RF (or Δθ') higher than the neighboring {1,5//6}o and {2,2//6}o orbital shells.

SunQM-3s7.update-2 (only for myself)

Figure 4, Saturn's {0,1//3} should not fit to (but need lower than) {-1,1//2}, so it may need to add one more shell.

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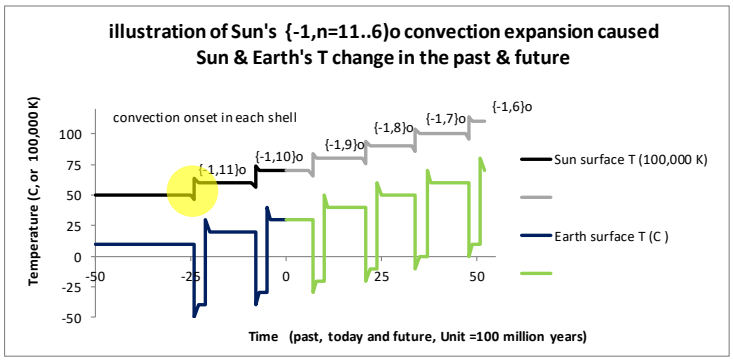
[12] SunQM-3s8: Using {N,n} QM To Study Sun's Internal Structure, Convective Zone Formation, Planetary Differentiation and Temperature r-Distribution. http://vixra.org/pdf/1808.0637v1.pdf (submitted on 2018-08-29)

SunQM-3s8.update-1

Add Figure 2b to illustrate that Sun surface's temperature jump up through a noisy phase during the onset of a new convection.



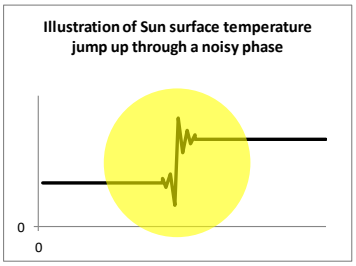


Figure 2a. Illustration of Sun's {-1,n=11..6}o orbit shell convection expansion caused Sun and Earth's surface temperature change in history and in future.

Figure 2b. Illustration of Sun surface's temperature jump up through a noisy phase during the onset of a new convection. The whole noisy transition phase may last thousands of years.

SunQM-3s8.update-2

According to Figure 2, in the Sun, the last conversion phase of {-1,10//6}o orbital shell from a (previous) radiation shell to a (current) convection shell was 650 million years ago, and the next conversion phase of {-1,9//6}o orbital shell from a (current) radiation shell to a (future) convection shell will be 650 million years later. So, currently we are at exactly the middle between the two conversion phases. It is reasonable to believe that the middle period between two conversion phases is the calmest period for the Sun's abnormal, noisy, and violent activities. If we assume that this extreme calm period between two conversion phases lasts about 600 million years, then, only during this period of time window, the life on Earth (or any planet) can evolve from low level to high level. Once this window is closed, the life on Earth (or any planet) may will have to go back from high level to low level (because of harsh climate caused by the Sun's abnormal, noisy, and violent activities). However, with the fast development of the science and technology, we hope that the human being will be able to break through this window and keep ourselves as the high level creature.

Thanks KPBS/NOVA TV program, and BBS, showed me the knowledge of the Snowball Earth (in the early 2000?).

SunQM-3s8.update-3

Page 7, paragraph 1, "*According to this ~~imaged~~ story*", imagined. "*{~~N~~,n=11.6}o*", {0,n=11..6}o. Figure 1, Sun's {0,1//6} should not fit to (but need lower than) {-1,5//62}, so it may need to add one more shell.

SunQM-3s8.update-4

See SunQM-3s11's section I-b "*A major correction for inside Sun's (or inside planet's, or inside pre-Sun ball's) radial wave function R(r)*". However, although H-atom's R(r) function describes an empty space from r=0 to r=∞, inside the Sun, the mass density radial differentiation compressed a r[0, ∞] space into a r[0, $r_{sun\text{-}surface}$], and it makes a r[0, $r_{sun\text{-}surface}$] space an equivalent to an empty r[0, ∞] space for the same H-atom's R(r) function. In other words, a mass density radial differentiation compressed r[0, $r_{sun\text{-}surface}$] space is an effective empty r[0, ∞] space for the same H-atom's R(r) function.

SunQM-3s8.update-5

Similar as H-fusion currently may be happening only in Sun's {-1,5//6}o orbital shell space, the He-fusion currently may be happening only in Sun's {-2,3//6}o shell space.

SunQM-3s8.update-6

Need to mention what Douglas C. Giancoli's text book "Physics for Scientists & Engineers with Modern Physics, 4th ed. 2009. p1200, Figure 44-7" said: "*A shell of "burning" hydrogen surrounding the core where the newly formed helium gravitates*".

SunQM-3s8.update-7

For SunQM-3s8's section III, better to use the nuclear-based {N,n//6} instead of the previously electron-based periodic table to describe Sun's {-1,n=1..5//6}o composition. For example, inside Sun, the {-1,1//6} sized core is composed of Au-like elements (or, Z ≥ 79, or {-14,n=3..5//6}o nuclides), the {-1,1//6}o shell is composed of Fe-like elements (or, Z ≥ 26, or {-14,n=1..2//6}o nuclides), the {-1,2//6}o shell is composed of metal-like elements (or, Z ≥ 3, or {-15,n=3..5//6}o nuclides), the {-1,n=3..4//6}o shell is composed of He-elements (or, Z = 2, or {-15,1//6}o nuclides), the {-1,n=5//6}o shell is composed of H-element (or, Z = 1, or {-15,1//6} sized nuclei).

SunQM-3s8.update-8

(1/2)mv^2_{avg} = (3/2) kT need to be changed to: $\frac{1}{2}m\overline{v^2} = \frac{3}{2}kt$

SunQM-3s8.update-9

I heard the "snowball Earth" story from the KPBS NOVA TV program, and from BBS's published DVD video (in early 2000?). Thank these publications for the popular science education.

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[13] SunQM-3s9: Using {N,n} QM to Explain the Sunspot Drift, the Continental Drift, and Sun's and Earth's Magnetic Dynamo. http://vixra.org/pdf/1812.0318v2.pdf (replaced on 2019-01-10)

SunQM-3s9.update-1

Figure 8, top plot, "phase-2, |400>" should be "phase-2, |430>", "phase-2, |400>, |411>, |422>" should be "phase-2, |430>, |431>, |432>".

SunQM-3s9.update-2

Figure 9, top plot, "phase-2, |400>" should be "phase-2, |430>", "phase-2, |400>, |411>, |422>" should be "phase-2, |430>, |431>, |432>".

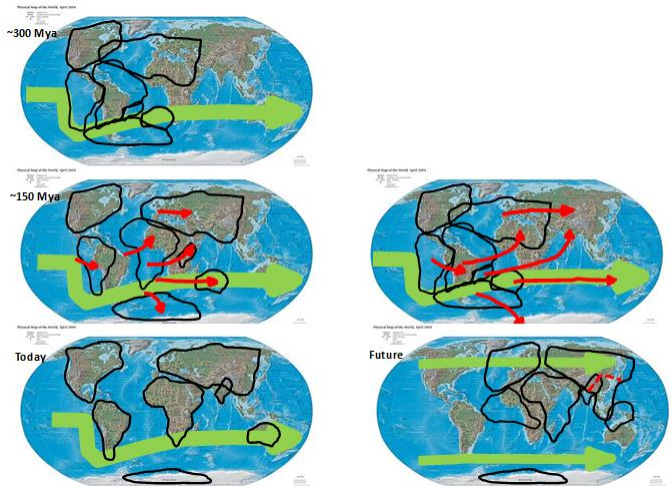
SunQM-3s9.update-3

In Figure 8, the assumptions "*sunspot only occurs at the 2nd half phase*" is because at the 1st half phase, the interface between the fast speed and the slow speed may be too broad (in longitude or θ-1D), so there is no sharp interface to generate the major turbulent swirls (which are the sunspots). Only at the 2nd half phase, the interface between the fast speed and the slow speed may become very narrow, then the sharp speed differential interface will generate the major turbulent swirls and sunspots. (Note: The above was my explanation in 2019. For my new explanation, see SunQM-6s11's Fig-10b).

SunQM-3s9.update-4

1) In Figure 10, the green thick line-arrow (in pictures of left middle, left bottom, and right middle) needs to be drawn more accurately according to the description in the paper.

2) For some unknown reason, the (old) PDF's vector image processing might distort the original image, so below I presented the same image in raster image format:



SunQM-3s9.update-5

Although the formation of Andes (at the west coastline of South America continent) fits well for the post-Pangaea's Y*l*m cycle theory, the formation of the post-Pangaea's North America continent west coastline was still a mystery for me. In June 2019, six months after I posted my "SunQM-3s9" paper, I happened to watch PBS NOVA's online video "Making North America: Origins (by David H. Koch)" again. At around 47:00/53:31, Koch explained how the North America coastline grew during the last ~100 million years as: the Pacific plate moving towards the North America plate, it generated a Japan-sized island near the coast and then pushed this island to the North America west coast to form the new coastline, and then slipped

this newly formed coastline to further north along the coast, and then repeated this process again and again. Then I suddenly realized that this is exactly I am looking for: when the Y*l*m phase-1's mantle surface stream flew eastward at the Earth's equator (which carries the Pacific plate on top of it) and blocked by a dam of South America and North America plates, the basic hydrodynamics knowledge tells us that it must have looked both northward and southward for the exit. The northward flow stream of mantle surface (although it never finds an exit due to the North America plate is too strong to break) is exactly the driving force for the North America coastline growing in David H. Koch's theory, and this is the same driving force that is currently moving the west side of San Andreas fault to the northwest. Meanwhile the southward flow stream of mantle did break the dam at the southern end of South America plate, and the mantle surface that flown out of a break dam's mouth generated the Earth map from post-Pangaea up to today.

SunQM-3s9.update-6

In section II, "*Here we have a big assumption: the driving forces of both convection and Ylm cycle only affect the positive ions because they have (relative) large mass, and these driving forces do not affect electrons because they have almost zero mass*". This is because we are studying the G-force induced QM effect, so that it only affects the mass (i.e., the positive ions that have large mass), not the charge (i.e., mostly the electrons that have low mass).

For the same reason, in section I-d Figure 4a, "At +30° latitude, the speed difference between the fast eastward |211> zonal band and the slower eastward |100> background induces anti-clock major local swirls …, The sharp front of anti-clock major local swirls induces the secondary clock-wise minor local swirls …", the G-force QM effect only affects (ion particle's) mass, not (ion particle's) charge.

Similarly, I guessed that in a spinning rotor of an electric generator, it is the positive ions that forced the rotor to rotate (because they are the large sized atoms, or the atomic positive ions), and the negative ions are forced to stay in their relative static position (because they are the small sized electrons, thus they can be fixed the position by the stator). Thus, the relative motion between the rotational positive ions and the static negative ions produces the electricity. (Note: I never saw this kind of explanation before). I believe that this is the similar effect as that "*the driving forces of both convection and Ylm cycle only affect the positive ions because they have (relative) large mass, and these driving forces do not affect electrons because they have almost zero mass*".

Similarly, in the electric line that transporting the electricity, the high electric voltage (at the two ends of the line) forces the positive/negative charges to move. However, the positive ions have the large mass so that they are firmly fixed in the electric line. Only the small negative ions (i.e., the electrons) are movable (because they have the small mass). Thus, the electricity transporting is achieved by transporting the electrons in the line.

SunQM-3s9.update-7

In < 1% mass occupancy space, the nLL QM effect causes the mass in the shell space to disk-lyzing (i.e., disk-forming). In ~ 100% mass occupancy space, the (residue) nLL QM effect causes the mass in the shell space to do Y*l*m cycle (see SunQM-6s11).

SunQM-3s9.update-8

Problem: When the inner ω_n mass (or particle) moves to outer ω_{n+x}, the angular momentum conservation will make ω_{n+x} slower, then why Jupiter's oozed out |544> band still keeps the relative faster angular momentum? Answer: See SunQM-6s11's section-II, "… *the Residue nLL State Caused Positive Precession May Be the Origin of* …".

SunQM-3s9.update-9

In SunQM-6s11, the "primary zonal band" is now changed name to "the major residue nLL QM state", and the "secondary zonal band" is now changed name to "the minor residue nLL QM state".

SunQM-3s9.update-10

In section-I, "*So far the leading model for both sunspot drift and Sun's magnetic field is Babcock's magnetic dynamo model. My {N,n} QM explanation of sunspot drift is also largely based on Babcock's magnetic dynamo model*". In section-I-e, I said that "*While the explanation of Phase-1 is directly based on both the sunspot's butterfly pattern and*

Babcock's magnetic dynamo model, the explanation of Phase-2 is based only on the sunspot's butterfly pattern, and not on the Babcock's model (because I don't understand how it can explain phase-2)". In SunQM-6s11, I proved that in the phase-2 of the Y*lm* cycle, the (minor) residue nLL QM state stream flows slower than that of the background. Notice that this result makes the SunQM-3s9's Fig-2 explanation become inaccurate. According to SunQM-6s11's result, the background flow speed is constant, the phase-1 has the (minor) residue nLL QM state stream flows faster, and phase-2 has the (minor) residue nLL QM state stream flows slower.

SunQM-3s9.update-11

Wiki "Great Rift Valley" said: "*… is in the process of splitting the African plate into two new and separate plates. Geologists generally refer to these evolving plates as the Nubian plate and the Somali plate*". We may can use the Y*lm* cycle theory to explain this phenomenon: our Earth's mantle surface (at the equator) is currently at the Y*lm* cycle at phase-1, it is not only pushing the whole African plate eastward, but also pushing the east part of African plate (i.e., the African plate) harder than the rest (west and central) part of the African plate, so that they are separating now.

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[14] SunQM-3s4: Using {N,n} QM Structure and Multiplier n' To Analyze Saturn's Ring Structure.
http://vixra.org/pdf/1903.0211v1.pdf (submitted on 2019-03-11)

SunQM-3s4.update-1

In abstract, following "*For Neptune and Uranus, both of their surfaces are at pCore{0,2//2} size, and their major rings are at pCore{0,3//2} orbit. For Saturn and Jupiter, both of their surfaces are at around pCore{0,3//3} size, and their major rings are at pCore{0,4//3} orbit.*", add "For Earth that has the surface at pCore{0,1//2} size, its major ring should be at pCore{0,2//2} orbit, i.e., at 4x of the Earth's radius".

SunQM-3s4.update-2

In the section-VII, "*Just like the temporary and extreme low mass density Kordylewski dust cloud has been found recently at the Earth–Moon Lagrange point L5 …*". Thanks the website http://bbs.creaders.net/ mentioned this experimental result, and I happened to see it, and thus I used it here to support my study result.

SunQM-3s4.update-3

SunQM-3s4's Fig-3 is incorrect, because the coordinate origin of r^2 *|R(n,l)|^2 curve was not set at the center of Saturn ball, but at the surface of Saturn. In SunQM-3s10's eq-5, r^2 *|R(n,*l*=n-1)|^2 ∝ [r/r_n * exp(1 - r/r_n)]^(2*n), I figured out what is the correct formula for this purpose. To use this formula, we need to know Saturn B-ring's r_n value. According to SunQM-3s6's Table-2, the standard {N,n} structural model for Saturn has an Earth-sized core with $r_{n=1}$ = 6.32E+6 meters. As shown in SunQM-3s4, using Saturn's Earth-sized core as the p{0,1//2} = p{0,1//3}, Saturn's surface is at p{0,3//3}, Saturn's B-ring is at p{0,4//3}. Thus the r_n for the B-ring in the formula was calculated as $r_{n=4} = r_1 * n^2$ = (6.32E+6) *4^2 = 1.01E+8 meters, as shown in the Table below.

Table "SunQM-3s4.update-3-1". Saturn's p{N,n//2} QM structure.

Saturn {N,n} n=	$r_n = r_1 n^2$	planet size	planet ring
	meter		
0.25	3.95E+05	Earth inner-inner-core	
0.5	1.58E+06	Earth inner-core	
1	6.32E+06	Earth size	
2	2.53E+07	Neptune size	Earth's ring
3	5.69E+07	Saturn size	Neptune's ring
4	1.01E+08		Saturn's ring
5	1.58E+08		

Then, using SunQM-3s10's eq-5, I re-calculated the radial Born probability density function r^2*|R(n,n-1)|^2 at n = 4, 8, 16, see Table "SunQM-3s4.update-3-2" (from left to right, respectively) below.

Results and Discussions:

1) See in Table "SunQM-3s4.update-3-2" (the left table), at n=4, the r_1 of the p{0,1//2} QM structure was chosen at the Earth-size 6.32E+6 meters, and the resulted cut-off was at ~70% for ABC-rings (see the green colored cell range), and at ~90% for B-ring (see the orange colored cell range).

2) See in Table "SunQM-3s4.update-3-2" (the middle table), at n=8, the r_1 of the p{0,1//2} QM structure was chosen at the Earth-inner-core size 1.58E+6 meters, and the resulted cut-off was at ~50% for ABC-rings (see green cells), and at ~80% for B-ring (see orange cells).

3) See in Table "SunQM-3s4.update-3-2" (the right table), at n=16, the r_1 of the p{0,1//2} QM structure was chosen at the Earth-inner-inner-core size 0.395E+6 meters, and the resulted cut-off was at ~30% for ABC-rings (see green cells), and at ~75% for B-ring (see orange cells).

4) From Figure "SunQM-3s4.update-3-2" (bottom picture, assuming that it is the true data picture, not the artist drew picture), I estimated that both A-ring and C-ring have ~30% (or less) mass density in comparison to that of the B-ring. So, I guessed that the n=16 (with r_1 at ~400 km from the Saturn's center, or equivalent to Earth's inner-inner-core size) is the best description for Saturn's ABC-rings' {N,n} QM.

5) Notice that there is a little bit off-set in r-1D positions between Figure "SunQM-3s4.update-3-2" top (the probability curve peak maximum) and bottom (the B-ring),. This is mainly because that in the calculation, I chose the B-ring's r_n at 1.01E+8 meters (that was calculated according to the calculated model shown in SunQM-3s6's Table-2 with $r_{n=1}$ = 6.32E+6 meters). However, if we use the NASA's data for the Saturn's B-ring (shown in SunQM-3s4's Table-1, and calculated as $r_{n=16}$ = avg(0.92E+8, 1.18E+8) = 1.05E+8 meters), then the calculated probability peak will better match to the B-ring's position in r-1D (in Figure "SunQM-3s4.update-3-2").

Table "SunQM-3s4.update-3-2". Radial Born probability density function r^2*|R(n,n-1)|^2 calculation at n = 4, 8, 16, (from left to right).

n=	4	
r_1= (a=)	6.32E+06	meter
r_n=	1.01E+08	meter
r/r_1=	r^2 *|R(4,3)|^2	r= (m)
0.4	3.76E-10	2.53E+06
4	0.006	2.53E+07
6.8	0.106	4.30E+07
8.8	0.308	5.56E+07
10.4	0.526	6.57E+07
12	0.741	7.58E+07
13.6	0.906	8.60E+07
14.4	0.959	9.10E+07
15.2	0.990	9.61E+07
16	1.000	1.01E+08
16.8	0.990	1.06E+08
17.6	0.962	1.11E+08
18.8	0.894	1.19E+08
20.8	0.738	1.31E+08
23.2	0.532	1.47E+08
26	0.326	1.64E+08
28.4	0.198	1.79E+08
31.2	0.104	1.97E+08
36	0.029	2.28E+08
40	0.009	2.53E+08

n=	8	
r_1= (a=)	1.58E+06	meter
r_n=	1.01E+08	meter
r/r_1=	r^2 *|R(8,7)|^2	r= (m)
1.6	1.41E-19	2.53E+06
16	0.000	2.53E+07
27.2	0.011	4.30E+07
35.2	0.095	5.56E+07
41.6	0.276	6.57E+07
48	0.550	7.58E+07
54.4	0.821	8.60E+07
57.6	0.920	9.10E+07
60.8	0.980	9.61E+07
64	1.000	1.01E+08
67.2	0.980	1.06E+08
70.4	0.926	1.11E+08
75.2	0.800	1.19E+08
83.2	0.545	1.31E+08
92.8	0.283	1.47E+08
104	0.106	1.64E+08
113.6	0.039	1.79E+08
124.8	0.011	1.97E+08
144	8.68E-04	2.28E+08
160	8.54E-05	2.53E+08

n=	16	
r_1= (a=)	3.95E+05	meter
r_n=	1.01E+08	meter
r/r_1=	r^2 *|R(16,15)|^2	r= (m)
6.4	2.00E-38	2.53E+06
64	0.000	2.53E+07
108.8	0.000	4.30E+07
140.8	0.009	5.56E+07
166.4	0.076	6.57E+07
192	0.302	7.58E+07
217.6	0.674	8.60E+07
230.4	0.846	9.10E+07
243.2	0.961	9.61E+07
256	1.000	1.01E+08
268.8	0.960	1.06E+08
281.6	0.857	1.11E+08
300.8	0.640	1.19E+08
332.8	0.296	1.31E+08
371.2	0.080	1.47E+08
416	0.011	1.64E+08
454.4	0.002	1.79E+08
499.2	0.000	1.97E+08
576	7.54E-07	2.28E+08
640	7.30E-09	2.53E+08

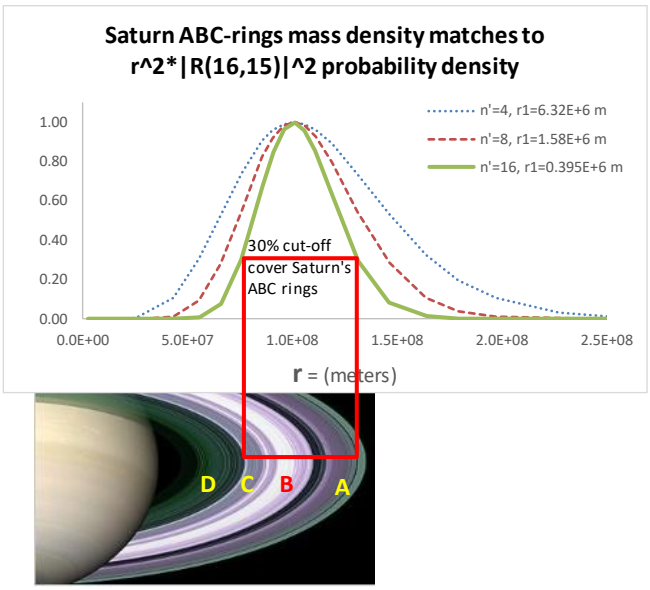

Figure "SunQM-3s4.update-3-2".
Top: Radial Born probability density function r^2*|R(n,n-1)|^2, at n = 4, 8, 16, calculated curves.
Bottom: To show that for n=16 curve, the peak-width at 30% cut-off matches Saturn's ABC-rings in r-1D.

SunQM-3s4.update-4

Also see SunQM-6s11's Appendix-B-2b, "*In the r-1D, during the ring-forming process after the pre-Sun ball's disk had formed, Δr from large to small, actually it is also the nLL QM state's n number increase from low to high. For example, Earth from n = 5 of the |5,4,4> QM state to n = 5*6^1 of |30,29,29> , then to n = 5*6^2 of |180,179,179> , etc.*"

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[15] SunQM-3s10: Using {N,n} QM's Eigen n to Constitute Asteroid/Kuiper Belts, and Solar {N=1..4,n} Region's Mass Density r-Distribution and Evolution. http://vixra.org/pdf/1909.0267v1.pdf (submitted on 2019-09-12)

SunQM-3s10.update-1

In section VIII: More Discussions, in item 5), add:
Although a major population (called KBO-cold) of small methane-ice mixture fragments in the Kuiper belt is in the Eigen |192,191,191> QM state, many more small methane-ice mixture fragments in the Kuiper belt are currently not in |192,191,191> state, but in |192,191,m> QM states with the quantum number |m| < 191. This is most likely that because the Mars-equivalent dwarf planets (like Pluto, Haumea, Makemake, etc.) prevents those small methane-ice mixture fragment's orbits to collapse to the lowest energy orbit at m = 191. After Sun-wind-stop-line expand to {2,8//6}, all small methane-ice mixture fragments are expected to migrate to {2,8//6} orbit, then all those small methane-ice mixture fragments with |m| < 191 are expected to collapse to the lowest energy orbit with m = 191 by the spinning Sun's nLL QM effect, so that the future methane-ice belt at{2,8//6} may be completely in Eigen |192,191,191> QM state.

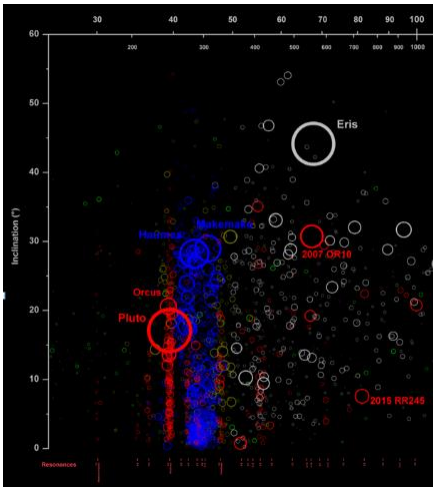
SunQM-3s10.update-2

In section II, add: Determine Kuiper Belt's θ' angle for using n = 5.33, n' = 6*5.33 = 32, and n' = 6*6*5.33 = 192, and then do calculations for |6,5,5>, |32,31,31>, and |192,191,191> belts, see the table below.

Result: at 10% cut-off, θ' = 6.3°, 15.5°, 40°, for n' = 192, 32, and 5.33, they fit to the experimental data (in Figure 2a) reasonably well.

Table "SunQM-3s10.update-3".

	1% cut-off		10% cut-off	
Kuiper Belt's n'	θ'= arccos [0.01^(1/(2*(n-1)))]	θ'=	θ'= arccos [0.1^(1/(2*(n-1)))]	θ'=
	arc	degree	arc	degree
5.33	0.943	54.0	0.697	40.0
31.98	0.381	21.8	0.271	15.5
191.88	0.155	8.9	0.110	6.3



SunQM-3s10.update-3

Add a figure: rocky-mass density peak at {1,4//6} where Venus located (just outside of rock-evap-line), H_2O/He mass density peak at {2,2//6} where Jupiter located (just outside of ice-evap-line), and methane mass density peak at {2,6//6} where Kuiper belt located (just outside of methane-evap-line).

SunQM-3s10.update-4

There might be four waves of Solar system's mass migration in r-1D:

1) The 1st wave: Gravity caused quantum collapse in r-1D, only 1/2000 of mass (that had nLL mode of motion) was leftover on the circular orbits of {N=1..4,n//6}, the rest > 99.9% mass that had RF mode of motion (excluding the nLL mode) all collapsed into Sun. In QM's terminology, this mass inward migration is the de-excitation from a high QM state to a low QM state.

2) The 2nd wave: The orbital moving mass was expelled by the expanding ice-evap-line, the rock-evap-line, and the methane-evap-line. In QM's terminology, this mass outward migration is the excitation from a low QM state to a high QM state, after absorbed the exciting energy (i.e., the heat radiated from the Sun).

3) The 3rd wave: The orbital moving mass was further expelled to form a red giant. Again, in QM's terminology, this mass outward migration is the excitation from a low QM state to a high QM state, after absorbed the exciting energy (i.e., the heat radiated from the Sun).

4) The 4th wave: the explosion of the outer shell, and the collapse of the inner core to a white dwarf.

SunQM-3s10.update-5

In Figure 8, I showed that for our Sun, the stop-line of the nLL-force (θ-1D force) is guessed at {4,1//6}, the stop-line of the bound-state G-force (r-1D force) is guessed at {5,1//6}, the stop-line of the unbound-state G-force (r-1D force) is guessed at {6,1//6}. Based on that, I believed that the nLL QM-force's sub-force of disk-forming, (or the RFg-force (that is a θφ-2D force)), is a short force in comparison with its primary G-force (r-1D force).

Here is a more complete description of the "nLL QM-force": it is a pseudo force that only shows up in a spin-reference-frame, it contains a θ-1D component force that forces n state mass from two poles (and/or high latitude regions) to the equator (or, it forces m=-l, … +l to m=+l, i.e., the pseudo force that forces a ball-shaped structure into a disk-shaped structure); it also contains a Δr-1D component force that forces n state mass distribution from either $r \le r_n$ or $r \ge r_n$ to exactly $r = r_n$ for all of each n orbit (i.e., the pseudo force that forces a disk into several rings). Note: Usually when I mentioned "nLL QM-force", I (almost) always refer to its θ-1D force that forcing a ball into a disk, and rarely concern its Δr-1D component force that forcing a disk into a series of rings.

In solar system's {N=1,..3,n=1..5//6}o orbital space, because the "nLL QM-force" forced a disk into 5 rings (for each N super shell), so the mass on each n orbit was able to be concentrated enough (as five mass rings) to (further) accrete into five planets (at the {N=1,..3,n=2..6//6} sized orbits). In the Oort cloud {4,n=1..5//6}o orbital space, the "nLL QM-force" (both the disk-forming force and disk-to-ring force) was stopped (or too weak and overcome by the interstellar disturbance), so that the matter fragments are no longer concentrated on the {4,n=1..5}o orbits, therefore, no planets were formed.

SunQM-3s10.update-6

In SunQM-3s10's section-I "*Using {N,n//q} QM structure to explain how Asteroid belt and Kuiper belt were formed*", I wanted to use the boulders that piled-up at the Hudson river's estuary for mimicking (that I watched in one KPBS/NOVA TV program in the early 2000), but I was not able to find this TV program online any more. So I used the New York Central park's boulder as the mimic.

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[16] SunQM-3s11: Using {N,n} QM's Probability Density 3D Map to Build A Complete Solar System with Time-dependent Orbital Movement (Semi-QM deduction). https://vixra.org/pdf/1912.0212v1.pdf (original submitted on 2019-12-11)

SunQM-3s11.update-1

SunQM-3s11b's eq-44 lacks of a major explanation when it is used to calculate a planet's 3D (high resolution) probability density map (to describe the whole Solar system with time-dependent orbital movement, in eq-47 through eq-54, and in eq-58 through eq-61 of SunQM-3s11): for each r_n , it should use base n (for Earth is 5*6^1=30), while for the power index, it should use high-frequency n' (for Earth is n' =5*6^11 >1E+9).

$$r^2|\Psi(r,\theta,\phi-\omega t)_{Planet}|^2 \approx \left(\frac{r}{r_n}e^{\left(1-\frac{r}{r_n}\right)}\right)^{2n} \sin(\theta)^{2(n-1)} \left\{\frac{1}{1+2\delta}\sum_{-\delta}^{+\delta}\cos[(n-1+\delta)(\varphi-\omega t)]\right\}^2$$

SunQM-3s11b-eq-44, original, WRONG

$$r^2|\Psi(r,\theta,\phi-\omega t)_{Planet}|^2 \approx \left(\frac{r}{r_n}e^{\left(1-\frac{r}{r_n}\right)}\right)^{2n'} \sin(\theta)^{2(n'-1)} \left\{\frac{1}{1+2\delta}\sum_{-\delta}^{+\delta}\cos[(n'-1+\delta)(\varphi-\omega t)]\right\}^2$$

SunQM-3s11b-eq-44, corrected

SunQM-3s11.update-2

In section-X, discussion-5, the quantum expansion of Sun's H-fusion ball, He-fusion ball, C-fusion ball, etc. and the red giant, may also follow {N,n//6} QM dynamics (see SunQM-1s1's Table-7b, and SunQM-3s8's section-III).

In section-X, add discussion-11, "*All planets in Solar system are formed in p{N,1//2} QM structure (see SunQM-3s6 Table 2), and Sun itself can be as a {N,1//2} QM structure (see SunQM-3s7 section VIII), so that {N,1//2} seems to be the most basic QM structure for the formation of celestial body in the macro world*". We know that {N,n//2} QM is a unary numeral system (see SunQM-1's section-VII and wiki "Unary numeral system"), this means that the base-n = 1 (or q = 2 in a {N,n//q} structure) numeral system may be the most basic QM structure for the formation of celestial body in the macro world. "*Will this also be true in the micro world?*".

SunQM-3s11.update-3.

Correction of SunQM-3s11's Table-1. Corrected the wrong calculation in column-17, so that now b(r) in column-17 equals to b(θ) in column-24.

NASA's data of planets						assigned N, n, period factor			set total n=1 at Sun core calc model n, rn, vn			Determine planet r-dimensional n' & w						Determine planet θ-dimensional n' & w Note: w(ϕ) = w(θ), and $n'_\theta = n'_\phi$					{N,n} calculated ω			initial ϕ= day-0	day-0	day-60	day-60
	mass	Sun's body-r or planets' orbit-r_n	vn	orbit period	planet's body-r, b=	N	n	period factor	total n from Sun core	rn= r1*n^2	v_n = sqrt(GM/ r_n)	n' = ln(0.1) / [ln(1 + b /r_n) - (b /r_n)]	w= log(n' / n) / log(6)	round up w	n', = n*q^w	±b = at n'=n*q^w & Porb =0.01	r_1 = r_n / (n*q^w)^ 2	r_1 at {N,1//6}	w(θ) =	n'_θ = n*q^w	0.01^(1/(2n'))	θ'= acos[0.01 ^(1/(2n'))]	b= r*sin(θ')	phase $\omega_{n,ph} = v_n$ / r_n/2	group ω = $\omega_n = v_n$ / r_n	period T= 2π/(2ω)/(3600*24)	day-0, 8/14 /2019	day-0	60	60
unit	kg	m	m/s	days	m					m	m/s					m	m					arc	m	arc/s	arc/s	day	degree	arc	degree	Δdegree
Sun core		1.74E+08				0	1	6	1	1.74E+08																				
SUN	1.989E+30	6.96E+08				0	2	6	2	6.96E+08																				
{0,3} corona						0	3	6	3	1.57E+09																				
{0,4} corona						0	4	6	4	2.78E+09																				
{0,5} corona						0	5	6	5	4.35E+09																				
{0,6} corona end						0	6	6	6	6.26E+09																				
{1,2}						1	2	6	12	2.50E+10																				
Mercury	3.3E+23	5.79E+10	47400	88	2.44E+06	1	3	6	18	5.64E+10	48533	2.46E+09	11.45	11	1.09E+09	3.67E+06	4.76E-08	(-10,1//6)	11	1.09E+09	0.9999999977884414	6.50E-05	3.67E+06	4.31E-07	8.61E-07	84	62	1.08	318	256
Venus	4.87E+24	1.08E+11	35000	224.7	6.05E+06	1	4	6	24	1.00E+11	36400	1.26E+09	10.92	11	1.45E+09	5.64E+06	4.76E-08	(-10,1//6)	11	1.45E+09	0.9999999988413311	5.63E-05	5.64E+06	1.82E-07	3.63E-07	200	180	3.14	288	108
Earth	5.97E+24	1.49E+11	29800	365.2	6.38E+06	1	5	6	30	1.57E+11	29120	2.77E+09	11.24	11	1.81E+09	7.89E+06	4.76E-08	(-10,1//6)	11	1.81E+09	0.9999999998730648	5.04E-05	7.89E+06	9.30E-08	1.86E-07	391	0	0.00	55	55
Mars	6.42E+23	2.28E+11	24100	687	3.40E+06	1	6	6	36	2.25E+11	24266	2.03E+10	12.25	12	1.31E+10	4.23E+06	1.32E-09	(-11,1//6)	12	1.31E+10	0.9999999998237701	1.88E-05	4.23E+06	5.38E-08	1.08E-07	676	191	3.33	223	32
Asteroid belt	2.92E+21	4.02E+11				1	8	6	48	4.01E+11	18200													2.27E-08	4.54E-08	1601				
Jupiter	1.90E+27	7.78E+11	13100	4331	7.15E+07	2	2	5.33	64.0	7.12E+11	13658	4.56E+08	10.67	11	7.26E+08	5.67E+07	1.35E-06	(-9,1//6)	11	7.26E+08	0.9999999996826621	7.97E-05	5.67E+07	9.60E-09	1.92E-08	3788	304	5.31	310	6
Saturn	5.68E+26	1.43E+12	9700	10747	6.03E+07	2	3	5.33	95.9	1.60E+12	9106	3.25E+09	11.54	12	6.53E+09	4.25E+07	3.75E-08	(-10,1//6)	12	6.53E+09	0.9999999999647402	2.66E-05	4.25E+07	2.84E-09	5.69E-09	1.28E+04	329	5.74	331	2
Uranus	8.68E+25	2.97E+12	6800	30589	2.56E+07	2	4	5.33	127.9	2.85E+12	6829	5.71E+10	12.98	13	5.22E+10	2.67E+07	1.04E-09	(-11,1//6)	13	5.22E+10	0.9999999999955925	9.39E-06	2.67E+07	1.20E-09	2.40E-09	3.03E+04	73	1.27	74	1
Neptune	1.02E+26	4.51E+12	5400	59800	2.48E+07	2	5	5.33	159.9	4.45E+12	5463	1.48E+11	13.39	13	6.53E+10	3.73E+07	1.04E-09	(-11,1//6)	13	6.53E+10	0.9999999999964740	8.40E-06	3.73E+07	6.14E-10	1.23E-09	5.92E+04	30	0.52	30	0
Kuiper belt	1.46E+22	5.91E+12				2	6	5.33	191.9	6.40E+12	4553													3.55E-10	7.11E-10	1.02E+05				
{3,2}	7.12E+25				2.18E+07	3	2	6	383.8	2.56E+13	2276	6.35E+12	16.00	16	5.64E+12	2.31E+07	8.05E-13	(-13,1//6)	16	5.64E+12	0.9999999999999592	9.03E-07	2.31E+07	4.44E-11	8.89E-11	8.18E+05				
{3,3}	3.99E+25				1.80E+07	3	3	6	575.6	5.76E+13	1518	4.73E+13	16.89	17	5.08E+13	1.74E+07	2.24E-14	(-14,1//6)	17	5.08E+13	0.9999999999999955	3.01E-07	1.73E+07	1.32E-11	2.63E-11	2.76E+06				
{3,4}	2.75E+25				1.59E+07	3	4	6	767.5	1.02E+14	1138	1.92E+14	17.51	18	4.06E+14	1.09E+07	6.21E-16	(-15,1//6)	18	4.06E+14	0.9999999999999994	1.06E-07	1.09E+07	5.55E-12	1.11E-11	6.55E+06				
{3,5}	1.98E+25				1.42E+07	3	5	6	959.4	1.60E+14	911	5.67E+14	18.00	18	5.08E+14	1.53E+07	6.21E-16	(-15,1//6)	18	5.08E+14	0.9999999999999995	9.54E-08	1.53E+07	2.84E-12	5.69E-12	1.28E+07				

Also showed in SunQM-7's Appendix-E.

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[17] SunQM-4: Using Full-QM Deduction and {N,n} QM's Non-Born Probability Density 3D Map to Build A Complete Solar System with Orbital Movement. https://vixra.org/pdf/2003.0556v2.pdf (replaced on 2021-02-03)

SunQM-4.update-1

In SunQM-4 section I-c, all f_n should be $f_{n,ph}$, and all f_j should be $f_{j,ph}$. Also $E_n = -Hmf_n$ should be written as $E_n = -Hmf_{n,ph}$.

SunQM-4.update-2

Eq-19, it should be $\Psi_k(x,t) = Ae^{\left[i\left(kx-\frac{\hbar k^2}{2m'}t\right)\right]}$, not $Ae^{\left[i\left(kx-\frac{\hbar k^2}{2m'}\right)t\right]}$

SunQM-4.update-3

"*Because eq-21 includes the $E_{r,n}$'s contribution (see SunQM-4s4 section VII for more detailed explanation)*". Note: This explanation was not discussed in SunQM-4s4 (now changed name as SunQM-6s11). It may will be discussed in the future.

SunQM-4.update-4

The old version of SunQM-4's eq-56 (submitted on 3/25/2020) is not correct. In the new SunQM-4 (submitted on 2/3/2021), among four possible formulas, eq-56c (in Appendix-C) is the best.

$$r^2\left|\Psi(r,\theta,\varphi,t)_{planet}\right|^2_{NBP} \propto \left[\frac{r}{r_n}e^{\left(1-\frac{r}{r_n}\right)}\right]^n\left[\sin(\theta)\cos\left(\varphi - \frac{n}{n-1}\omega_n t\right)\right]^{n-1}$$ SunQM-4's eq-56c

Also see SunQM-7's Appendix-F.

Also see SunQM-6s1's eq-39, $|Y(l=n-1, m=n-1)|^2_{NBP} \propto [\sin(\theta)]^{(n-1)}[\cos(\varphi)]^{n-1}$, versus SunQM-6s1's eq-38, $\left|Y\left(l=n-1, \pm m=\pm(n-1)\right)\right|^2 = [\sin(\theta)]^{2(n-1)}[\cos(\varphi)]^{2(n-1)}$. According to this, SunQM-4s2's Fig-2 is incorrect, and need to be redo.

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[18] SunQM-4s1: Is Born Probability Merely A Special Case of (the More Generalized) Non-Born Probability (NBP)? https://vixra.org/pdf/2005.0093v1.pdf (submitted on 2020-05-07)

SunQM-4s1.update-1

Double-slit, should not use NBP, because its interference pattern is determined by y-axis, which is perpendicular to the flying path x-axis. In y-axis, it is still standing wave, so should still use Born Probability.

SunQM-4s1.update-2

Because its conjugated-squaring calculation cancels out all φ-dimensional function (that involves the imaginary value), does Born probability automatically degenerate a θφ-2D QM into a θ-1D QM?

SunQM-4s1.update-3

In eq-26, the switch of $\{[\cos(\varphi/2) + i\ \sin(\varphi/2)]^2\}^m \rightarrow \{[\cos(\varphi/2)]^2\}^m$ maybe means to switch (or to project) from RF space into φ-1D space, and vice versa.

SunQM-4s1.update-4

All f_n should be $f_{n,ph}$, and all f_j should be $f_{j,ph}$. Also $E_n = -Hmf_n$ should be written as $E_n = -Hmf_{n,ph}$.

SunQM-4s1.update-5

Eq-27b, or Figure 6, and Figure 9, can explain the multiple objects on the same orbit with equal-size, equal-mass, equal-distance.

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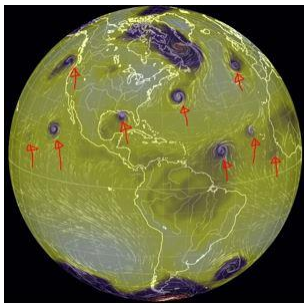
[19] SunQM-4s2: Using {N,n} QM and Non-Born Probability to Analyze Earth Atmosphere's Global Pattern and the Local Weather. https://vixra.org/pdf/2007.0007v1.pdf (submitted on 2020-07-01)

SunQM-4s2.update-1

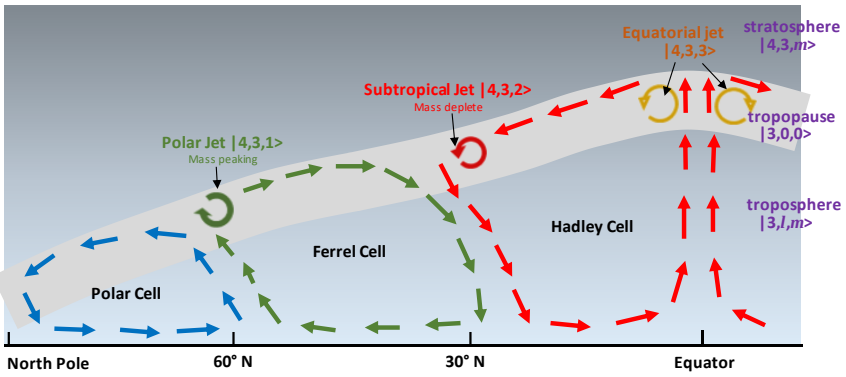
On Sep. 15, 2020, a partial quantum weather with total 9 low pressure centers crossing the east-Pacific, Gulf of Mexico, and Atlantic(with 6 major, 1 middle, and 2 minor low pressure centers) showed up. See https://earth.nullschool.net/#2020/09/15/0600Z/wind/surface/level/overlay=mean_sea_level_pressure/orthographic=-73.11,14.01,296

Thanks the website http://bbs.creaders.net/ mentioned this result, and I happened to see it, and thus I used it here to support my study result.



SunQM-4s2.update-2

In SunQM-6s11's Fig-4, I re-assigned the polar jet as in |4,3,1> QM state, the subtropical jets as in |4,3,2> QM state. For this, I have to re-assign the Earth atmosphere shell as the effective p{0,3//2}o orbital shell of the Earth, and assign the Earth crust shell as the effective p{0,2//2}o orbital shell of the Earth.



SunQM-4s2.update-3

As mentioned in "SunQM-4.update-4", according to SunQM-4's eq-56c, Table-1 & Fig-2 need to be corrected. But because SunQM-4's eq-56c index is n (not 2n), the θ-1D NBP peak curve still become broader?

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[20] SunQM-5: Using the Interior {N,n//6} QM to Describe an Atom's Nucleus-Electron System, and to Scan from Sub-quark to Universe (Drafted in April 2018). https://vixra.org/pdf/2107.0048v1.pdf （submitted on 2021-07-06)

SunQM-5.update-1

In Table 1 the last column should be removed. Check SunQM-7's Table-5 for the better description.

SunQM-5.update-2

Wiki "Lead" said, "*Lead has the highest atomic number of any stable element and three of its isotopes are endpoints of major nuclear decay chains of heavier elements*". Wiki "Decay chain" said, "*In nuclear science, the decay chain refers to a series of radioactive decays of different radioactive decay products as a sequential series of transformations. It is also known as a "radioactive cascade"*". Figure 2 showed that a group of elements from Os (Z= 76, $n_{nuc-rel}$ = 28), to Pb (Z= 82, $n_{nuc-rel}$ = 30) have relative high abundancy, and they fitted to the {-14,4//7} sized QM structure quite well. So, Pb 's "*isotopes are endpoints of major nuclear decay chains of heavier elements*" because Pb 's nucleus has a relative stable {-14,4//7} sized QM structure, with ~ 100% nucleon occupancy in the nuclear {-14,3//7}o orbital shell space.

SunQM-5.update-3

(Note: This section should go to SunQM-5, or goes to SunQM-7s1). Why Earth/planet has H/He shell, mantle shell, Fe core? This is all because of theirs nuclear {N,n} QM state, or (nuclear density?)

1) H nucleus is the ground state of {-15,n//6}, or it has size of {-15,1//6}, or {-16,5//6}o, so it goes to the planet's primitive atmosphere shell;

2) He nucleus is the 1st excited state of {-15,n//6}, or {-15,1//6}o, and a ground state {N,1//6} sized QM structure is often "accompanied" by a {N,2//6} sized (i.e., the first excited state {N,1//6}o orbital shell) QM structure, so it also goes to the planet's primitive atmosphere shell;

3) Li ~ Ne nuclides belong to the ground state of {-14,n//6}, or it has size of {-14,1//6}, or {-15,n=2..5//6}o, so they goes to the planet's mantle shell;

4) Z = 11~25 nuclides are the 1st excited state of {-14,n//6}, or {-14,1//6}o, and a ground state {N,1//6} sized QM structure is often "accompanied" by a {N,2//6} sized (i.e., the first excited state {N,1//6}o orbital shell) QM structure, so they also go to the planet's mantle shell;

5) Z = 26 Fe is the end of the 1st excited state of {-14,n//6}, or {-14,1//6}o, and it has higher abundance (due to its higher {N,n//6} QM structural stability), so it become effectively the beginning of the {-14,2//6}o shell, which equivalent to the {-14,n=2..5//6}o, so they goes to the planet's Fe core.

SunQM-5.update-4

Any celestial body (planet, satellite, moon, asteroid, comet, etc.), if it is re-shaped into an almost perfect sphere (by its own gravity, or by its own mass), then I believe that it has the {N,n//2} QM structure, and it must have a core with radius at about ¼ of its surface radius. If it is not re-shaped into a sphere (by its own gravity, or by its own mass), then it does not follow the {N,n//2} QM structure, has no $r_{surface}/4$ core, and it is still dominated by the residual E/RFe-force. I named this as the "**spherical celestial body equals {N,n//2}**" hypothesis.

SunQM-5.update-5

(Besides the **"5 of {-15,2//6} particles" effect** that 5 of {-15,2//6} sized particles forms one {-15,6//6} = {-14,1//6} sized particle), there may be a similar **"4 of {-15,1//6} particles" effect**, in which a single n=1, or {-15,1//6} sized particle is one Oxygen nucleus (that containing 16 nucleons). Then n^2 = 2^2 = 4 of {-15,1//6} particles grouped to become a single n=2 particle with {-15,2//6} size, and it should have 4*16 = 56 nucleons. And then, we find that Fe nucleus does have 56 nucleons, and have the size of n=2 at {-15,2//6}.

SunQM-5.update-6

If Table-2 is correct, then the maximum atom at the effective size of {-10,1//6} will have Z = 128, or, with 128 protons and 128 electrons, and with about 192 neutrons (assumed the neutron/proton ratio =1.5 per nucleus). If Z > 128, then the (outmost shell) protons of the nucleus will physically crash with the (innermost shell) electrons. However, although we cannot have a real Z = 200 atom, we may still can have a "pseudo Z" = 200 atom. It will have 128 protons and 128 electrons, and with about (200*2.5 – 128 =) 372 neutrons, and with the effective atom size of {-10,1//6}, practically the same size as that of the Z = 128 atom. Of course, it can be treated as an isotope of the Og-118 atom. Why this isotopic Og-118 with "pseudo Z" = 200 atom may can exist? It is because adding more neutrons (in a 118 pairs of proton-electron atom) either does not decrease the $r_1 = r_1/Z$ (i.e., the innermost edge of the n=1 electron shell, because Z = 118 is fixed), or does not significantly increase the size (i.e., the radius) of the nucleus (of the "pseudo Z" = 200 atom, because of the relationship of the ball volume = $\frac{4}{3}\pi r^3$).

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[21] SunQM-5s1: White Dwarf, Neutron Star, and Black Hole Re-analyzed By Using the Internal {N,n} QM (Drafted in April 2018). https://vixra.org/pdf/2107.0084v1.pdf （submitted on 2021-07-13)

SunQM-5s1.update-1

In abstract, "a Sun {0,2} quantum collapse to {-5,1}, shrink by ΔN = -5 plus Δn = -1, was explained as directly caused by the shrink of hydrogen atom {-12,1}o (or e1{0,1}o) orbital shell by ΔN = -5 plus Δn = -1 to a quark-sized virtual atom {-17,1} (or e1{-5,1})", up-quark size {-17,2//6}, so shrink from Sun {0,2//6} is ΔN = -5 plus Δn = 0.

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[22] SunQM-5s2: Using {N,n//6} QM to Explore Elementary Particles and the Possible Sub-quark Particles. https://vixra.org/pdf/2107.0104v1.pdf (submitted on 2021-07-18)

SunQM-5s2.update-1

In some recent SunQM papers' reference, the linkers for SunQM-5s2, -6s1, -7, were accidently added one empty space, need to be removed.

SunQM-5s2.update-2

The quantum collapse of up-quark or down-quark (from high-generation to low generation, e.g., from 3rd generation to 2nd generation to 1st generation, or from up-qk to charm to top, or from down-qk to stranger to bottom), is the same as that of the quantum collapse of the Sun from {0,2//6} "4th-generation", to white dwarf {-1,1//6} "3rd-generation", to {-2,1//6} "2nd-generation", to {-3,1//6} "1st-generation". Or, it is the same as that of the quantum collapse of a pre-Sun ball from {6,1//6} to {5,1//6}, then to {4,1//6}, {3,1//6}, {2,1//6}, {1,1//6}, {0,2//6}, one-by-one.

More specifically, the quantum collapse of down-type quarks (from 3rd gen to 2nd gen to 1st gen, or from {-15,3//6} size to {-16,3//6} size to {-17,3//6} size) is more like the pre-Sun ball quantum collapsed from sizes of {6,1//6} to {5,1//6}, then to {4,1//6}, {3,1//6}, {2,1//6}, {1,1//6}, {0,2//6}, one-by-one (and without skip any step); and the quantum collapse of up-type quarks (from charm quark {-15,2//6} size to up-quark {-17,2//6} size, and skipped the {-16,2//6} size) is more like the Sun {0,2//6} size quantum collapses to neutron star {-3,2//6} size (and skipped both {-1,2//6} size and {-2,2//6} size).

Also see SunQM-6s6's section-IV-f for the similar explanation.

SunQM-5s2.update-3

To mimic Standard Model's description that the bottom quark is the 3rd generation (that may correlate to {-15,2//6}o), the strange quark is the 2nd generation (that correlate to {-16,2//6}o), and the down quark is the 1st generation (that may correlate to {-17,2//6}o), Sun {0,2//6} size collapse to {-3,2//6} sized neutron star, can be said as from 4th generation to 1st generation. In this way, the quark generation decay (from 3rd, to 2nd, to 1st) is not the only one (in the {N,n//6} QM structure table), the same thing also happens to a star (in the same {N,n//6} QM structure table) when it collapse from a Sun to a neutron star (from 4th generation, to the 1st generation, one by one). This analysis also strongly supports that the up-quark (1st gen.) is correlate to {-17,1//6}o, the charm quark should be the 3rd (instead of 2nd) generation, and should correlate to {-15,1//6}o, and the true 2nd generation up-type quark (that should correlate to {-16,1//6}o QM state) is still missing.

SunQM-5s2.update-4

Add into SunQM-5s2's section IV, and SunQM-7's section I-i.

Format-1: following format is the correct format (for N), and is the commonly used format.

{N,1//6}o, = {N-1,n=6..11//6}o, = {N-2,n=36..71//6}o,
{N,2//6}o, = {N-1,n=12..17//6}o, = {N-2,n=72..107//6}o,
{N,3//6}o, = {N-1,n=18..23//6}o, = {N-2,n=108..143//6}o,
{N,4//6}o, = {N-1,n=24..29//6}o, = {N-2,n=144..179//6}o,
{N,5//6}o, = {N-1,n=30..35//6}o, = {N-2,n=180..215//6}o.

Format-2: {N,n//6^j} format is correct, but is a rarely used format. It emphasized that it is in a N super-shell QM state but with a high-frequency n' that moved r_1 inward by $\Delta N = j-1$.

{N,1//6}o, = {N,n=6..11//6^2}o, = {N,n=36..71//6^3}o,
{N,2//6}o, = {N,n=12..17//6^2}o, = {N,n=72..107//6^3}o,
{N,3//6}o, = {N,n=18..23//6^2}o, = {N,n=108..143//6^3}o,
{N,4//6}o, = {N,n=24..29//6^2}o, = {N,n=144..179//6^3}o,
{N,5//6}o, = {N,n=30..35//6^2}o, = {N,n=180..215//6^3}o.

However, following format is WRONG. Because it used the same meaning operation two twice for moving r_1 inward one time:

{N,1//6}o, = {N-1,n=6..11//6^2}o, = {N-2,n=36..71//6^3}o,
{N,2//6}o, = {N-1,n=12..17//6^2}o, = {N-2,n=72..107//6^3}o,
{N,3//6}o, = {N-1,n=18..23//6^2}o, = {N-2,n=108..143//6^3}o,
{N,4//6}o, = {N-1,n=24..29//6^2}o, = {N-2,n=144..179//6^3}o,
{N,5//6}o, = {N-1,n=30..35//6^2}o, = {N-2,n=180..215//6^3}o.

So, in all SunQM papers, we should generally use Format-1. Only when we need to emphasize that it is in a N super-shell QM state but with a high-frequency n' that moved r_1 inward by $\Delta N = j-1$, then use Formet-2 {N,n//6^j}.

So, in SunQM-5s2, the definition of "{N=-15..-14,n=1..5//6}o = {-15,n=1..35//6}o = {-14,n=1..35//6^2}o" is not wrong.

SunQM-5s2.update-5

In SunQM-5s2's section-V Example-3, do not use "$^{12}_{6}C^{*}$ *decays to its ground state* $^{12}_{6}C$ *by emitting a 4.4 MeV gamma ray*", because "*the γ decay may can be attributed to the nuclear proton's pure E/RFe-force energy level de-excitation*" (see SunQM-6s6's section IV-c). So, instead, it may be better to use SunQM-6s6's Fig-6a path-1, beta-decay 14.4 MeV (that may be RFs-RFs interaction), or even better to use the S-force to S-force interaction (like alpha-decay?).

SunQM-5s2.update-6

Check Giancoli book, p1179, Table 43-2, particles, Mesons (pion 139 MeV, Kaon 493 MeV, Eta 547 MeV), Leptons (electron 0.511 MeV, Muon 105 MeV, Tau 1777 MeV). In the future, need to add Meson (2-qks) to {-16,4//6}o with size {-16,5//6}. Size ratio of meson (2-qk) to proton (3-qk) = (5/6)^2 = 0.69. And, also add Lepton in the master {N,n//6} table. See SunQM-1s2's Table-3.