SunQM-1s3: Applying {N,n} QM structure analysis to planets using exterior and interior {N,n} QM

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Abstract

The Solar QM {N,n//6} model is so successful in describing the QM of Sun-planet system, that inevitably it has to be able to describe the QM of planet-moon system. In this paper, I used {N,n} QM model to analyze all eight planets. The result revealed that Jupiter has a p{N,n//5} QM structure, Earth has a p{N,n//2} QM structure. Neptune possibly has a p{N,n//2} or p{N,n//4} QM structure, Saturn possibly has a mixture of p{N,n//2} and p{N,n//3} QM structure. The rest planets have no clear p{N,n} QM structure. Through a global data analysis, I discovered that all eight planets were originally formed in p{N,n//2} QM structure, with an atmosphere at p{1,1//2}, a Earth-sized core at p{0,1//2}, and a inner core at p{-1,1//2}. Then after the (hydrogen fusion generated) ice-evap-line expanded and passed {1,6}, all {1,n=3..6}o orbit planets' p{1,1//2} atmosphere mass was stripped off (like the current Earth), and even part of Earth-sized core was stripped off (like the current Mars). Jupiter captured most part of the stripped off mass (which grew its mass from originally 10% to today's 100%) and transformed its p{N,n} from p{N,1//2} to today's p{N,n//5}. Saturn captured small part of the stripped off mass (which grew its mass from originally 20% to today's 100%) and transformed its p{N,n} from p{N,1//2} to today's mixture of p{N,1//2} and p{N,n//3}. Among eight planets, only Uranus and Neptune still keep the original p{N,1//2} QM structure with almost intact p{1,1//2} atmosphere, p{0,1//2} Earth-sized core, and p{-1,1//2} inner core. The limitation of p{N,n} QM analysis for meter-sized objects has been discussed.

Introduction

In paper SunQM-1 [1], I established a Quantum Mechanic {N,n//6} structure for our Solar system. Its exterior part includes {1,5}o orbit for Earth, {2,2}o orbit for Jupiter, {4,n=1..5}o orbits for Oort cloud, etc. Its interior part contains {-1,1} for white dwarf, {-3,2} for neutron star, and {-3,1} for black hole, etc. This QM {N,n} structural analysis is suitable for any central G-force formed celestial body structure. It is suitable for Solar system, it should also suitable for the planets, and moons. In this paper I try to use the same principle to analyze the QM structure of planets and moons.

The base-5*6^ in Solar's {N,n//6} structure is believed to associate with the mass quantity of the Sun. So for planet, or moon, it is possible to have different base-pfactor-n number. In fact, in our simplified model, this is the only unknown parameter we need to determine. Since the mass of planets are much less than the mass of Sun, so I expect that planet's pfactor ≤ 6. The minimum orbit n is = 1. The minimum base-pfactor-n is base-1*2^. So n = 2 is the minimum n number I am going to test. For each planet and moon, I need to test n = 6, 5, 4, 3, and 2, for the possible pfactor number. To determine this unknown parameter for a planet, I tested all possible base-pfactor-n to fit planet's outer (major) moons' orbits, as well as the planet's inner core size. The best fitted pfactor number will be accepted as the true pfactor number. During fitting, if needed, some small moons maybe treated as a combined body, and their averaged (estimated) orbit will be used for fitting. Since the judgment is only based on my eye, so it is only a rough estimation. After many tries, I realized that it is much easier to set {0,1} of {N,n} at the surface of planet (or moon), The most important judgment for the best fitted pfactor number is that we want the calculated n = sqrt(r_n/r_1) to be close to a integer number. We also want to have the calculated n(s) for all major moons' to be a sequential integer numbers. One important criterion is that the out-most major moon should have {N,1} size. Because we know that QM ground state (n = 1) structures, like {N-1,1}, {N,1}, {N+1,1}, are the most stable QM structures among all possible {N,n} structures. This is exactly like that in the chemical element periodic table, all noble elements have the most stable QM structure because their out-most shell is filled fully with electrons. For the same reason, the inner core of planet have to end with {N,1} size. This rule can also be extended as: if there are several "good" pfactor(s), pick the smallest n number. Although I am not sure how correct these results are, it is certainly a completely new way to analyze the celestial body's structure, mechanics, and its dynamic process.

Note-1: for {N,n} QM nomenclature as well as the general notes for {N,n} QM model, please see my paper SnQM-p1 section VII.
Note-2: If without any specification, {N,n} always means Sun{N,n//6} and it is base-5*6^ {N,n} QM structure with Sun at center, using Sun core as {0,1} and r_1 . While p{N,n} always means a planet's {N,n} QM structure with the planet (or moon) at center, most time using planet surface as {0,1}, and with the pfactor need to be specified.
Note-3: all orbit r(s) between planet and moon are the distance between two mass centers.
Note-4: Microsoft Excel's number format is often used in this paper, for example: x^2 = x^2, 3.4E+12 = $3.4*10^{12}$, 5.6E-9 = $5.6*10^{-9}$.

I. Determine Jupiter's p{N,n} QM structure

Let us first determine Jupiter's p{N,n} QM structure. Since its mass is over 3× bigger than Saturn, and over 10× bigger than the rest of planets, and its structure is well developed, Jupiter becomes the best example for studying the pure gravity generated (no heat disturbance by hydrogen fusion) QM effect on a celestial body in our universe. It is certainly much better than Sun, because Sun's hydrogen fusion heat has messed up a lot of details of the pure gravity QM {N,n} structure !

I-a. Determine Jupiter's exterior p{N,n} QM structure by fitting to its moon's orbits, using Jupiter's surface as p{0,1}RF

Table 1a. Determine Jupiter's p{N,n} QM structure by fitting to its moon's orbits, with Jupiter's surface as p{0,1}RF. The orbit data of Jupiter's moons are obtained from wiki "Moons of Jupiter". All {N,n} in this table means p{N,n}.

pFactor =			6		5		4		3		2	
p{0,1}RF, r1=			6.99E+07		6.99E+07		6.99E+07		6.99E+07		6.99E+07	
{1,1}, r=r1*pFactor^2			2.52E+09		1.75E+09		1.12E+09		6.29E+08		2.80E+08	
{2,1}, r=r1*pFactor^4			9.06E+10		4.37E+10		1.79E+10		5.66E+09		1.12E+09	
{3,1}, r=r1*pFactor^6			3.26E+12		1.09E+12		2.86E+11		5.10E+10		4.47E+09	
{4,1}, r=r1*pFactor^8			1.17E+14		2.73E+13		4.58E+12		4.59E+11		1.79E+10	
	mass, kg	orbit, r_n	n= $sqrt(r_n/r_1)$		n= $sqrt(r_n/r_1)$		n= $sqrt(r_n/r_1)$		n= $sqrt(r_n/r_1)$		n= $sqrt(r_n/r_1)$	
Jupiter	1.898E+27	6.99E+07	1.00	{0,1//6}	1.00	{0,1//5}	1.00	{0,1//4}	1.00	{0,1//3}	1.00	{0,1//2}
rings	1.00E+11	1.30E+08	1.36	{0,1}	1.36	{0,1}	1.36		1.36		1.36	
4 moons	2.00E+18	1.80E+08	1.60	{0,2}	1.60	{0,2}	1.60		1.60		1.60	
Io	8.90E+22	4.22E+08	2.46	{0,2}	2.46	{0,2}	2.46	{0,2}	2.46	{0,2}	1.23	{1,1.2//2}
Europa	4.80E+22	6.71E+08	3.10	{0,3}	3.10	{0,3}	3.10	{0,3}	3.10	{0,3}	1.55	{1,1.5//2}
Ganymede	1.48E+23	1.07E+09	3.91	{0,4}	3.91	{0,4}	3.91	{0,4}	1.30	{1,1}	1.96	{2,1//2}
Callisto	1.08E+23	1.88E+09	5.19	{0,5}	5.19	{0,5}	1.30	{1,1}	1.73	{1,2}	1.30	{2,1.3//2}
6 moons	6.70E+18	1.10E+10	2.09	{1,2}	2.51	{1,2-3}	3.14		1.39	{2,1}	0.78	{4,1/2}
53 moon	3.00E+17	2.30E+10	3.02	{1,3}	3.63	{1,3-4}	4.53		2.02	{2,2}	1.13	{4,1/2}

Result:
Here I only consider the four large massed moons (Io, Europa, Ganymede, and Callisto) of Jupiter, and omit all other small massed moons and rings. Both pfactor =6, and =5 are reasonably good fitting for Jupiter's four major moons' orbits.

I-b. Determine Jupiter's interior p{N,n} QM structure by fitting to its inner core's size, using Jupiter's surface as p{0,1}RF

Table 1b. Determine Jupiter's p{N,n} QM structure by fitting to its inner core's size, with Jupiter's surface as p{0,1}RF. All {N,n} in this table means p{N,n}.

pFactor =		6		5		4		3		2	
p{0,1}RF, r1=		6.99E+07		6.99E+07		6.99E+07		6.99E+07		6.99E+07	
{-1,1}, r=r1/pFactor^2		1.94E+06		2.80E+06		4.37E+06		7.77E+06		1.75E+07	
{-2,1}, r=r1/pFactor^4		5.39E+04		1.12E+05		2.73E+05		8.63E+05		4.37E+06	
{-3,1}, r=r1/pFactor^6		1.50E+03		4.47E+03		1.71E+04		9.59E+04		1.09E+06	
	orbit rn , m	n= pFactor*sqrt (r_n / r_1)		n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt (r_n / r_1)		n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt (r_n / r_1)	
Jupiter atmosphere	6.99E+07	6.00	{0,1}={-1,6/	5.00	{0,1//5}	4.00	{0,1//4}	3.00	{0,1//3}	2.00	{0,1}={-1,2//2}
metallic hydrogen(1)	5.45E+07	5.30		4.42		3.53		2.65		1.77	
12~45x outer Earth's core	1.02E+07	2.29		1.91	{-1,2//5}	1.53		1.15		0.76	{-1,1//2}
12~45x inner Earth's core	3.74E+06	1.39		1.16	{-1,1//5}	0.92	{-1,1//4}	0.69		0.46	

Note: Jupiter's inner structure data is obtained from wiki "Jupiter",

(1) From wiki "Jupiter", "*The core region is surrounded by dense metallic hydrogen, which extends outward to about 78% of the radius of the planet.*" So its r = 6.99E+7 * 0.78 = 5.45E+7 meters.

(2) and (3) From wiki "Jupiter", "*In 1997, the existence of the core was suggested by gravitational measurements, indicating a mass of from 12 to 45 times that of Earth,* " From wiki "Earth", we know Earth's inner core's r=(6378-5100)km = 1.278E+6 meters, its outer core' r =(6378-2890)km = 3.488E+6 meters, Let us assume that the mass density of Jupiter's core is same as that of Earth's core, so 12× of mass can be translated as 12× of volume, which equivalent to r increased by 12^(1/3) times. So according to this information, the table below estimated the r of Jupiter's core by averaging 12× to 45× more volume as Earth's core.

	Earth core r, m	12x mass, r=, m	45x mass, r= , m	avg. r=, m
(2) mimic Earth outer core	3.49E+06	7.99E+06	1.24E+07	1.02E+07
(3) mimic Earth inner core	1.28E+06	2.93E+06	4.55E+06	3.74E+06

Result: pfactor = 5 is the best.

I-c. Discussion and Prediction for Jupiter's p{N,n//5} QM structure

Based on the fitting result for both exterior and interior structures of Jupiter, I choose the best result with the least common value, that is base-pfactor-n = 5. So Jupiter can be best fitted to a QM p{N,n//5} structure. In this QM structure, Jupiter's surface is at p{0,1//5}, its four major moons, Io, Europa, Ganymede, and Callisto, occupy orbits of p{0,2//5}, p{0,3//5}, p{0,4//5}, and p{0,5//5} respectively.

Prediction:

If there is no other disturbance, Jupiter will further evolve into (or may have already evolved as) a more perfect p{N,n//5} QM structure.

1) The p{N,n//5} QM structure predict that Jupiter's interior should have a p{-1,1//5} core, which should have a clear interface between this core and its outside layer (because n = 1 is the ground state). If wiki "Jupiter" mentioned result is correct (Jupiter core's mass is 12× to 45× of Earth's, see [3]), then the predicted Jupiter's p{0,1}RF core should have mass density close to that of Earth's inner core.

2) Jupiter should also contain several internal structures at p{-1,2//5}, p{-1,3//5}, and p{-1,4//5}, but they may or may not have the clear interface in between.

3) The rings and small moons between p{0,1}RF and p{0,2} are the un-fully developed residue mass, and they will be cleared out by the Jupiter's gravitational QM effect in the future. Also the moons (nearly 60 of them) outside p{0,5}= p{1,1}, are un-fully developed residue mass, and they will accrete into four bigger moons and take p{1,n=1..4}o orbits.

4) The famous atmosphere pattern at Jupiter surface should also can be modeled by using QM wave function |nlm> at state n = 5. For details, see my paper SunQM-3s3.

Now we can see why Jupiter is better than Sun to be a pure gravitational QM model, it retains all p{0,n=2..5}o orbits, while Sun doesn't because these orbits are within Sun's rock-evap-line. Jupiter has the atmosphere ring pattern which also reflects the detailed QM p{N,n} structural information (see paper SunQM-3s3), which Sun lacks of (again due to the heat mess-up). On the other side, Sun's much larger mass makes it be able to apply much stronger gravitational QM effect, causing super-shells as far as N = 4 to obey its {N,n} QM structure, while Jupiter's relative small mass can only apply its QM effect effectively up to p{0,5//5}. In shells of p{1,n=2..5//5}, Jupiter's gravitational QM effect is so weak, it may never be able to overcome the perturbation forces, so those ~60 small moons may never be able to accrete into 4 bigger moons to take p{1,n=1..4/5}o orbits.

However, due to Jupiter's relative large mass, the effect of perturbation is relatively much smaller for Jupiter than for other planets. So Jupiter has the most matured (or most stable) QM p{N,n} structure among all planets. As we will see in the following sections, very few of planets can get their p{N,n} QM structure determined clearly.

II. Determine Earth's p{N,n} QM structure

Among four rocky planets, Earth is the biggest one. It has a moon and a well known internal structure, so it has the best chance to get its p{N,n} QM structure determined among four rocky planets. Here we define Earth's solid surface as p{0,1}RF.

II-a. Determine Earth's exterior p{N,n} QM structure by fitting to its moon's orbits, with Earth's surface as p{0,1}RF

Here I calculate the Moon to Earth's center-to-center distance (data from wiki "Earth") as the r of Moon's orbit. Then I calculate Moon orbit's total n, based on Earth's surface is p{0,1}RF:

	body r, km	orbit r, m	orbit r, m	calc. n=sqrt(r_n/r_1)
Earth	6378		6.38E+06	
Moon	1738	384405	3.84E+08	7.76

Because the calculated Moon orbit's total n = sqrt(r_n/r_1) = 7.76, so I start the search from pfactor = 8, down to 2.

Table 2a. Determine Earth's p{N,n} QM structure by fitting to Moon's orbit, with Earth's surface as p{0,1}RF. All {N,n} in this table means p{N,n}.

Top													
pFactor =		8		6		5		4		3		2	
p{0,1}RF, r1=		6.38E+06		6.38E+06		6.38E+06		6.38E+06		6.38E+06		6.38E+06	
{1,1}, r=r1*pFactor^2		4.08E+08		2.30E+08		1.59E+08		1.02E+08		5.74E+07		2.55E+07	
{2,1}, r=r1*pFactor^4		2.61E+10		8.27E+09		3.99E+09		1.63E+09		5.17E+08		1.02E+08	
{3,1}, r=r1*pFactor^6		1.67E+12		2.98E+11		9.97E+10		2.61E+10		4.65E+09		4.08E+08	
	orbit r, m	n= $sqrt(r_n/r_1)$		n= $sqrt(r_n/r_1)$		n= $sqrt(r_n/r_1)$		n= $sqrt(r_n/r_1)$		n= $sqrt(r_n/r_1)$		n= $sqrt(r_n/r_1)$	
Earth	6.38E+06	1.00	{0,1//8}	1.00	{0,1//6}	1.00	{0,1//5}	1.00	{0,1//4}	1.00	{0,1//3}	1.00	{0,1//2}
Moon	3.84E+08	7.76	{0,8//8}	1.29	{1,1.3//6}	1.55	{1,1.5//6}	1.94	{1, 2//4}	2.59	{1,2.6//3}	1.94	{2,2//2}={3, 1//2}
Bottom													
Moon just formed	2.55E+07	2.00	{0,2//8}	2.00	{0,2//6}			2.00	{0,2//4}			2.00	{0,2//2}= {1,1//2}
Moon after 15-b-yr	6.69E+08	10.24	{0,10//8}	10.24	{1,1.7//6}			10.24	{1,2.6//4}			10.24	{3,1.3//2}

The result (from the top part of the table) shows that pfactor =2, 4, or 8, are all good for Moon's orbit.

II-b. Determine Earth's interior p{N,n} QM structure by fitting to its internal structure, with Earth's surface as p{0,1}RF

Data from wiki "Earth"

	Depth	orbit	orbit
	km	km	m
surface	0	6378	6.38E+06
Crust	35	6343	6.34E+06
Upper mantle	60	6318	6.32E+06
	100	6278	6.28E+06
Asthenosphere	700	5678	5.68E+06
mantle	2890	3488	3.49E+06
Outer core	5100	1278	1.28E+06
Inner core	6378	0	0.00E+00

Table 2b. Determine Earth's p{N,n} QM structure by fitting to its interior structure, with Earth's surface as p{0,1}RF. All {N,n} in this table means p{N,n}.

pFactor =		8		6		5		4		3		2	
p{0,1}RF, r1=		6.38E+06		6.38E+06		6.38E+06		6.38E+06		6.38E+06		6.38E+06	
{-1,1}, r=r1/pFactor^2		9.97E+04		1.77E+05		2.55E+05		3.99E+05		7.09E+05		1.59E+06	
{-2,1}, r=r1/pFactor^4		1.56E+03		4.92E+03		1.02E+04		2.49E+04		7.87E+04		3.99E+05	
{-3,1}, r=r1/pFactor^6		2.43E+01		1.37E+02		4.08E+02		1.56E+03		8.75E+03		9.97E+04	
	orbit rn , m	n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)	
Crust	6.38E+06	8.00	{0,1}={-1,8/,	6.00	{0,1//6}	5.00	{0,1//5}	4.00	{0,1//4}	3.00	{0,1//3}	2.00	{0,1//2}={-1,2//2}
Upper mantle	6.34E+06	7.98		5.98		4.99		3.99		2.99		1.99	
Asthenosphere	6.32E+06	7.96		5.97		4.98		3.98		2.99		1.99	
mantle	6.28E+06	7.94		5.95		4.96		3.97		2.98		1.98	
mantle	5.68E+06	7.55		5.66		4.72		3.77		2.83		1.89	
Outer core	3.49E+06	5.92	{-1,6//8}	4.44		3.70		2.96	{-1,3//4}	2.22		1.48	
Inner core	1.28E+06	3.58	{-1,4//8}	2.69		2.24		1.79	{-1,2//4}	1.34		0.90	{-1,1//2}

The result shows that pfactor = 2 is the best, although both =4 and =8 are also good.

II-c. Discussion and Prediction for Earth's p{N,n//2} QM structure

1) Combine results from sections II-a, and II-b, the Earth's QM has a p{N,n//2} QM structure. The pfactor = 8, or = 4 are discarded because they do not make Earth's inner core has p{-1,1//n} structure. So under p{N,n//2} QM system, the current

Moon has an orbit of {3,1//2}o, and the inner core of Earth has an size of p{-1,1//2}. However, when we study the outer core of Earth, we need to use p{N,n//4} QM structure because the outer is at p{-1.3//4} (see paper SunQM-3s6).

2) According to the Giant Impact hypothesis (see wiki "Moon"), a Mars-sized Theia collided to the proto-Earth, blasted material into orbit about the Earth that then accreted to form the present Earth-Moon system. When the Moon was first formed, its orbit was not far from the Earth. From online "*How close was the Moon to the Earth when it formed? (Intermediate)" http://curious.astro.cornell.edu/our-solar-system/37-our-solar-system/the-moon/the-moon-and-the-earth/31-how-close-was-the-moon-to-the-earth-when-it-formed-intermediate "simulations suggest it was about 3-5 times the radius of the Earth, or about 20 to 30 thousand kilometers." "The rate of the Moon's movement away from Earth…is currently slowing down slightly, and it is estimated that in about 15 billion years the Moon's orbit will stop increasing in size*". So, a just-formed-Moon, orbit r = (3× ~ 5×) = 4× of Earth's r , or orbit r ≈ 4* 6.378E+6 = 2.55E+7 meters. An orbit at 4× of Earth's radius p{0,1}RF is also means it is at p{0,2//2} orbit of the Earth's p{N,n} QM system. This value is put into the Table 2a (bottom, as "moon just formed").

From wiki "Moon", current Moon recedes 38mm per year, if it linearly decreases to 0 mm per year in 15 billion years, equivalent to a (simplified) constant rate for 7.5 b-yrs, so the distance increased by =(38/1000*7.5*10^9)=2.85E+8 meters. So 15 b-yrs later the Moon's orbit r will be = 3.84E+8 + 2.85E+8 = 6.69E+8 meters. This value is put into the Table 2a (bottom, as "Moon after 15-b-yr"). So analyze the data in Table 2a (bottom) tells us, in QM word, that 4 billion years ago, the collision of proto-Earth & Theia excited part of material from the Earth's ground state p{0,1}RF into the excited states p{0,2//2}, p{0,3//2}, p{0,4//2}, and above. After de-excitation, the mass between p{0,1//2} and p{0,2//2} went back to Earth's surface p{0,1//2} , while mass between p{0,2//2} and p{0,3//2} (and above) formed Moon at orbit p{0,2//2}. (Note: this is according to paper SunQM-3s2 result: all mass between r_n and r_{n+1} belong to orbit n). Then, in the following 4 billion years, the tidal locking force continuously excited Moon to even higher excitation state, nearly up to close to p{0,8//2} = p{3,1//2} today. 15 billion years later from now, the Moon will stop the receding, and the final orbit will be at p{3,1.3//2}o orbit. However, my {N,n//2} QM structure does not support this prediction (due to n = 1.3 is too far away from a integer). According to {N,n//2} QM structure, Moon will stop receding at a more perfect p{3,1}o orbit with r = 4.08E+8 m, or 2.38E+7 m away from the current r = 3.84E+8 m.

3) Furthermore, Earth's atmosphere dynamics can also be analyzed by using the p{N,n//2} QM structure (see paper SunQM-3s3 for details). Actually, Earth's atmosphere can be either p{0,2//2} QM structure, or p{0,2//4} QM structure. It can be generalized as a rule that any planet/star (including Jupiter, Sun, … etc.) with surface = p{0,1}RF will have an n = 2 atmosphere QM structure of p{0,2} at any pfactor!

III. Determine Moon's p{N,n} QM structure

Now let us apply the same method to the Moon.

III-a. Determine Moon's exterior p{N,n} QM structure by fitting to its moon's orbits, with Moon's surface as p{0,1}RF

Here we need to treat the Earth as Moon's satellite, so the analysis is exact as in Table 2a (Top). pfactor = 2, 4, 8, are all "good" candidate.

III-b. Determine Moon's interior p{N,n} QM structure by fitting to its internal structure, with Moon's surface as p{0,1}RF

Data of Moon's internal structure is obtained from wiki "Moon". "*The Moon has a solid iron-rich inner core with a radius of 240 km and a fluid outer core primarily made of liquid iron with a radius of roughly 300 km. Around the core is a partially molten boundary layer with a radius of about 500 km*".

Table 3a. Determine Moon's p{N,n} QM structure by fitting to its internal structure, with Moon's surface as p{0,1}RF. All {N,n} in this table means p{N,n}.

pFactor =		8		6		5		4		3		2	
p{0,1}RF, r1=		1.74E+06		1.74E+06		1.74E+06		1.74E+06		1.74E+06		1.74E+06	
{-1,1}, r=r1/pFactor^2		2.71E+04		4.83E+04		6.95E+04		1.09E+05		1.93E+05		4.34E+05	
{-2,1}, r=r1/pFactor^4		4.24E+02		1.34E+03		2.78E+03		6.79E+03		2.14E+04		1.09E+05	
{-3,1}, r=r1/pFactor^6		6.63E+00		3.72E+01		1.11E+02		4.24E+02		2.38E+03		2.71E+04	
	orbit rn , m	n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)	
Moon crust	1.74E+06	8.00	{0,1}={-1,8}	6.00	{0,1}	5.00	{0,1}	4.00	{0,1}={-1,4}	3.00	{0,1}	2.00	{0,1}={-1,2/2}
Moon Mentle	1.69E+06	7.88		5.91		4.92		3.94		2.95		1.97	
partial melt	5.00E+05	4.29		3.22		2.68		2.15		1.61		1.07	{-1,1/2}
outer core (liquid)	3.00E+05	3.32		2.49		2.08		1.66		1.25		0.83	{-1,1/2}
inner core solid	2.40E+05	2.97		2.23		1.86		1.49		1.12		0.74	{-1,1/2}

Result:
Moon's internal structure can be best (although not perfectly) fitted to p{N,n//2} QM structure.

III-c. Moon's has a p{N,n//2} QM structure

Combine results from sections III-a, and III-b, the Moon's QM has a p{N,n//2} system. Under p{N,n//2} QM system, the current Moon has its satellite Earth on orbit p{3,1//2}, and the Moon's inner core at size of p{-1,1//2}. So for the Earth-Moon binary system, use either Earth or Moon as center for p{N,n} calculation, both works.

IV. Determine Neptune's p{N,n} QM structure

IV-a. Determine Neptune's exterior p{N,n} QM structure by fitting to its moon's orbits, with Neptune's surface as p{0,1}RF

Table 4a. Determine Neptune's p{N,n} QM structure by fitting to its moon's orbits, with Neptune's surface as p{0,1}RF. All {N,n} in this table means p{N,n}.

pFactor =			8		6		5		4		3		2	
p{0,1}RF, r1=			2.48E+07		2.48E+07		2.48E+07		2.48E+07		2.48E+07		2.48E+07	
{1,1}, r=r1*pFactor^2			1.58E+09		8.92E+08		6.19E+08		3.96E+08		2.23E+08		9.91E+07	
{2,1}, r=r1*pFactor^4			1.01E+11		3.21E+10		1.55E+10		6.34E+09		2.01E+09		3.96E+08	
{3,1}, r=r1*pFactor^6			6.49E+12		1.16E+12		3.87E+11		1.01E+11		1.81E+10		1.58E+09	
{4,1}, r=r1*pFactor^8													6.34E+09	
	mass, kg	orbit r_n	n= sqrt(r_n/r_1)		n= sqrt(r_n/r_1)		n= sqrt(r_n/r_1)		n= sqrt(r_n/r_1)		n= sqrt(r_n/r_1)		n= sqrt(r_n/r_1)	
Neptune	1.024E+26	2.48E+07	1.00	{0,1}	1.00	{0,1}	1.00	{0,1}	1.00	{0,1}	1.00	{0,1}	1.00	{0,1}
Proteus	5.04E+19	1.18E+08	2.18		2.18	{0,2//6}	2.18	{0,2//5}	2.18	{0,2//4}	2.18		1.09	{1,1//2}
Triton	2.14E+22	3.55E+08	3.78		3.78	{0,4//6}	3.78	{0,4//5}	0.95	{1,1//4}	3.78		0.95	{2,1//2}
Nerid	2.70E+19	5.51E+09	14.92		2.49	{1,2//6}	2.98	{1,3//5}	0.93	{2,1//4}	1.66		0.93	{4,1//2}

Note: Data of Neptune's internal and external structure is obtained from wiki "Neptune", or "Moons of Neptune"

Result:
Among 14 known moons, only three major moons (Proteus, Triton, and Nerid) are used for p{N,n} calculation in Table 4a. Based on the fitting result to the three largest satellites, both pp{N,n//4} and p{N,n//2} are good for Neptune's QM p{N,n}.

IV-b. Determine Neptune's interior p{N,n} QM structure by fitting to its internal structure, with Neptune's surface as p{0,1}RF

Wiki "Neptune" does not give any radius data information on Neptune's internal structure. However, one online citation *(http://classroom.synonym.com/internal-structure-neptune-21304.html*) mentioned: "*Astronomers believe that Neptune's core could be Earth-sized and composed of rock together with ammonia, methane and water ices*".

Table 4b. Determine Neptune's p{N,n} QM structure by fitting to its internal structure, with Neptune's surface as p{0,1}RF. All {N,n} in this table means p{N,n}.

pFactor =		8		6		5		4		3		2	
p{0,1}RF, r1=		2.48E+07		2.48E+07		2.48E+07		2.48E+07		2.48E+07		2.48E+07	
{-1,1}, r=r1/pFactor^2		3.87E+05		6.88E+05		9.91E+05		1.55E+06		2.75E+06		6.19E+06	
{-2,1}, r=r1/pFactor^4		6.05E+03		1.91E+04		3.96E+04		9.67E+04		3.06E+05		1.55E+06	
{-3,1}, r=r1/pFactor^6		9.45E+01		5.31E+02		1.58E+03		6.05E+03		3.40E+04		3.87E+05	
	orbit rn , m	n= pFactor*sqrt((r_n / r_1))		n= pFactor*sqrt((r_n / r_1))		n= pFactor*sqrt((r_n / r_1))		n= pFactor*sqrt((r_n / r_1))		n= pFactor*sqrt((r_n / r_1))		n= pFactor*sqrt((r_n / r_1))	
Neptune surface	2.48E+07	8.00	{0,1}	6.00	{0,1}	5.00	{0,1}	4.00	{0,1}	3.00	{0,1}	2.00	{0,1}={0,2}
core=Earth r	6.38E+06	4.06		3.04		2.54		2.03	{-1,2//4}	1.52		1.01	{-1,1//2}

If the core of Neptune is the size of Earth, then p{N,n//2} is best for Neptune.

IV-c. Neptune has a possible p{N,n//2}, or a possible p{N,n//4} QM structure

Combining results from sections IV-a, and IV-b, Neptune's QM has a p{N,n//2} system. But according to the previous result, Earth has pfactor = 2, Jupiter (317× of Earth's mass) has pfactor = 5, Sun (333000× of Earth's mass) has pfactor = 6, Moon (0.012× of Earth's mass) has pfactor = 2, so Neptune (17× of Earth's mass) is more reasonable to have pfactor = 4 (or =3) rather than = 2 (because I believe that the pfactor difference is caused by the gravitational strength). It is hard to know how much the retrograde orbit of Triton messed up Neptune's exterior p{N,n} QM structure. The fitting result in Table 4a shows pfactor = 4 is also possible for Neptune. In Table 9, a global fitting of all eight planets to a single model of p{N,n} QM structure also suggests that Neptune (same as all other planets) had an original p{N,1//2} QM structure. But if we use the Neptune's (predicted) inner core as r_1, then Neptune can also have a pfactor = 4.

V. Determine Uranus's p{N,n} QM structure

V-a. Determine Uranus's exterior p{N,n} QM structure by fitting to its moon's orbits, with Uranus's surface as p{0,1}RF

Table 5a. Determine Uranus 's p{N,n} QM structure by fitting to its moon's orbits, with Uranus 's surface as p{0,1}RF. All {N,n} in this table means p{N,n}.

pFactor =			8		6		5		4		3		2	
p{0,1}RF, r1=			2.56E+07		2.56E+07		2.56E+07		2.56E+07		2.56E+07		2.56E+07	
{1,1}, r=r1*pFactor^2			1.64E+09		9.20E+08		6.39E+08		4.09E+08		2.30E+08		1.02E+08	
{2,1}, r=r1*pFactor^4			1.05E+11		3.31E+10		1.60E+10		6.54E+09		2.07E+09		4.09E+08	
{3,1}, r=r1*pFactor^6			6.70E+12		1.19E+12		3.99E+11		1.05E+11		1.86E+10		1.64E+09	
{4,1}, r=r1*pFactor^8													6.54E+09	
	mass, kg	orbit rn	n= sqrt(r_n/r_1)		n= sqrt(r_n/r_1)		n= sqrt(r_n/r_1)		n= sqrt(r_n/r_1)		n= sqrt(r_n/r_1)		n= sqrt(r_n/r_1)	
Uranus	8.68E+25	2.56E+07	1.00	{0,1}	1.00	{0,1}	1.00	{0,1}	1.00	{0,1}	1.00	{0,1}	1.00	{0,1}
inner moon-1	1.70E+18	6.61E+07					1.61	{0,2}						
inner moon-2	2.90E+18	8.60E+07					1.83	{0,2}						
Miranda	6.59E+19	1.29E+08	2.25		2.25		2.25	{0,2}	2.25		2.25		1.12	{1,1//2}
Arial	1.353E+21	1.91E+08	2.73		2.73		2.73	{0,3}	2.73		2.73		1.37	{1,1.3//2}
Umbriel	1.172E+21	2.66E+08	3.23		3.23		3.23	{0,3}	3.23		3.23	N=0	0.81	{2,1//2}
Titania	3.527E+21	4.36E+08	4.13		4.13		4.13	{0,4}	4.13	N=0	1.38	N=1	1.03	{2,1//2}
Oberon	3.014E+21	5.84E+08	4.78		4.78		4.78	{0,5}	4.78	N=0	1.59	N=1	1.19	{2,1//2}
outer moon-1	8.50E+16	1.64E+10	3.17	N=1	4.22	N=1	1.01	{2,1}	1.58	N=2	2.82	N=2	1.58	{4,1.6//2}
outer moon-2	7.50E+16	1.75E+10	3.27	N=1	4.36	N=1	1.05	{2,1}	1.63	N=2	2.90	N=2	1.63	{4,1.6//2}

Note: Data of Uranus's internal and external structure was obtained from wiki "Uranus", or "moons of Uranus".

Among 27 known moons, only five major moons (Miranda, Arial, Umbriel, Titania, Oberon) are used for p{N,n} calculation in Table 5a. Fitting to Uranus’s five main moons does not give any good result, pfactor = 5 is a possible.

V-b. Determine Uranus’s interior p{N,n} QM structure by fitting to its internal structure, with Uranus 's surface as p{0,1}RF

From wiki "Uranus", *"The core is relatively small, with a mass of only 0.55 Earth masses and a radius less than 20% of Uranus's" "...and the upper atmosphere is relatively insubstantial, ... extending for the last 20% of Uranus's radius*"

Table 5b. Determine Uranus’s p{N,n} QM structure by fitting to its internal structure, with Uranus 's surface as p{0,1}RF. All {N,n} in this table means p{N,n}.

pFactor =		8		6		5		4		3		2	
p{0,1}RF, r1=		2.56E+07		2.56E+07		2.56E+07		2.56E+07		2.56E+07		2.56E+07	
{-1,1}, r=r1/pFactor^2		3.99E+05		7.10E+05		1.02E+06		1.60E+06		2.84E+06		6.39E+06	
{-2,1}, r=r1/pFactor^4		6.24E+03		1.97E+04		4.09E+04		9.98E+04		3.16E+05		1.60E+06	
{-3,1}, r=r1/pFactor^6		9.75E+01		5.48E+02		1.64E+03		6.24E+03		3.51E+04		3.99E+05	
	orbit rn , m	n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)	
Uranus surface	2.56E+07	8.00	{0,1}	6.00	{0,1}	5.00	{0,1}	4.00	{0,1}	3.00	{0,1}	2.00	{0,1}={-1,2}
mantle=0.8r	2.04E+07	7.16		5.37		4.47	{-1,4.5//5}	3.58		2.68		1.79	{-1,1.8//2)
core=0.2r	5.11E+06	3.58		2.68		2.24	(-1,2//5}	1.79		1.34		0.89	(-1,1//2}

Result: pfactor = 2 is a good fitting result.

V-c. Uranus’s p{N,n} QM structure has been messed up

Uranus’s QM p{N,n} system has been messed up, partly due to the strongly perturbation by its "big brother" neighbors Saturn and Jupiter. According to its mass (equivalent to that of Neptune), Uranus’s p{N,n} system is expected to be similar as that of Neptune. Since pfactor = 5 for Jupiter, and = 2 for Earth, then the expected pfactor will be =3 or 4 for a matured Uranus, if pfactor is solely depend on the mass. Uranus' self-spin axis is tilted sideways, caused by a collision with another celestial body long time ago (see wiki "Uranus"). It has the second lowest mass density (=1271 kg/m^3) among all planets, this may imply that it may still in shrinking of size. Uranus has 27 known natural satellites, also a sign of being hit not too long ago. So it is possible that these small moons are still accreting to become big ones. However, a global fitting of all eight planets (in Table 9) suggests that Uranus (same as Neptune) had an original p{N,1//2} QM structure, and a extended p{N,,1//4} QM structure.

VI. Determine Saturn's p{N,n} QM structure

V-a. Determine Saturn's exterior p{N,n} QM structure by fitting to its moon's orbits, with Saturn's surface as p{0,1}RF

Table 6a. Determine Saturn's p{N,n} QM structure by fitting to its moon's orbits, with Saturn's surface as p{0,1}RF. All {N,n} in this table means p{N,n}.

pFactor =				6		5		4		3		2	
p{0,1}RF, r1=				5.82E+07		5.82E+07		5.82E+07		5.82E+07		5.82E+07	
{1,1}, r=r1*pFactor^2				2.10E+09		1.46E+09		9.32E+08		5.24E+08		2.33E+08	
{2,1}, r=r1*pFactor^4				7.55E+10		3.64E+10		1.49E+10		4.72E+09		9.32E+08	
	mass, kg	orbit, r_n		n= sqrt(r_n/r_1)		n= sqrt(r_n/r_1)		n= sqrt(r_n/r_1)		n= sqrt(r_n/r_1)		n= sqrt(r_n/r_1)	
Saturn	5.68E+26	5.82E+07		1.00	{0,1}	1.00	{0,1}	1.00	{0,1}	1.00	{0,1}	1.00	{0,1}
Mimas	4E+19	1.86E+08		1.79	{0,2}	1.79	{0,2}	1.79	{0,2}	1.79	{0,2}	0.89	{1,1}
Enceladus	1.1E+20	2.38E+08		2.02	{0,2}	2.02	{0,2}	2.02	{0,2}	2.02	{0,2}	1.01	{1,1}
Tethys	6.2E+20	2.95E+08		2.25	{0,2}	2.25	{0,2}	2.25	{0,2}	2.25	{0,2}	1.12	{1,1}
Dione	1.1E+21	3.77E+08		2.55	{0,3}	2.55	{0,3}	2.55	{0,3}	2.55	{0,3}	1.27	{1,1}
Rhea	2.3E+21	5.27E+08		3.01	{0,3}	3.01	{0,3}	3.01	{0,3}	3.01	{0,3}	1.50	{1,1.5}
Titan	1.35E+23	1.22E+09		4.58		4.58		1.15	{1,1//4}	1.53	N=1	1.15	{2,1//2}
Iapetus	1.80E+21	3.56E+09		7.82		1.56	N=1	1.95	{1,2//4}	2.61	N=1	1.95	{3,1//2}

Note: Data of Saturn's internal and external structure was obtained from wiki "Saturn", or "moons of Saturn".

Among 62 known moons, only 7 major moons (Mimas, Enceladus, Tethys, Dione, Rhea, Titan, Lapetus) are used for p{N,n} calculation in Table 6a. If treat Lapetus as the most outer major moon, then pfactor = 2 is the best fitting. If treat Titan (75× more massive than that of Lapetus) as the most outer major moon, then pfactor = 4 is the best fitting.

VI-b. Determine Saturn's interior p{N,n} QM structure by fitting to its internal structure, with Saturn's surface as p{0,1}RF

From wiki "Saturn": "*estimated that the core must be 9–22 times the mass of the Earth, which corresponds to a diameter of about 25,000 km". "This is surrounded by a thicker liquid metallic hydrogen layer, followed by a liquid layer of helium-saturated molecular hydrogen that gradually transitions to a gas with increasing altitude". "The outermost layer spans 1,000 km and consists of gas*".

Table 6b. Determine Saturn's p{N,n} QM structure by fitting to its internal structure, with Saturn's surface as p{0,1}RF. All {N,n} in this table means p{N,n}.

pFactor =		8		6		5		4		3		2	
p{0,1}RF, r1=		5.82E+07		5.82E+07		5.82E+07		5.82E+07		5.82E+07		5.82E+07	
{-1,1}, r=r1/pFactor^2		9.10E+05		1.62E+06		2.33E+06		3.64E+06		6.47E+06		1.46E+07	
{-2,1}, r=r1/pFactor^4		1.42E+04		4.49E+04		9.32E+04		2.27E+05		7.19E+05		3.64E+06	
{-3,1}, r=r1/pFactor^6		2.22E+02		1.25E+03		3.73E+03		1.42E+04		7.99E+04		9.10E+05	
	orbit rn , m	n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)		n= pFactor*sqrt(r_n / r_1)	
Saturn surface gas	5.82E+07	8.00	{0,1}	6.00	{0,1}={-1,6}	5.00	{0,1}	4.00	{0,1}	3.00	{0,1}	2.00	{0,1}={-1,2}
metallic hydrogen	5.72E+07	7.93		5.95		4.96		3.97		2.97		1.98	
core	1.25E+07	3.71		2.78	{-1,3/6}	2.32		1.85	{-1,2/4}	1.39		0.93	{-1,1}

Result: pfactor = 2 is a good fitting result.

VI-c. Saturn's p{N,n} QM structure has been severely perturbed

Combining results from sections VI-a, and VI-b, it seems that Saturn may have a p{N,n//2} QM system. The p{N,n//4} QM system is also possible for Saturn.

Saturn has 62 moons with confirmed orbits, a clear ring structure, a super low mass density (= 687 kg/m^3), all these suggests that it is not a matured QM p{N,n} system. Like that of Uranus, Saturn's p{N,n} QM structure has been severely perturbed, probably by either a recent collision with another celestial body, or by its neighbor Jupiter, or both. If this immaturity is caused by the perturbation of Jupiter, then it will keep as is forever. On the other hand, if this immaturity is caused by a recent (unknown) major collision (say within 0.1 billion years), then after another 1 billion years, Saturn may become a more matured gas planet like Jupiter. If at that time Saturn will have the same density as Jupiter's, then its radius will decrease to = (687/1326)^(1/3) = 80% of current r. I had tried to use this 80% r to search for pfactor, no improved result was obtained (although it may favors pfactor=3, data not shown). Since pfactor = 5 for Jupiter, and =2 for Earth, then the expected pfactor will be = 4 for a matured Saturn, if pfactor is solely depend on the mass. The surface atmosphere band pattern of Saturn (see wiki "Saturn") suggests that it is more like n = 3 or 4 (see paper SunQM-3s3 for details).

VII. Determine Venus's p{N,n} QM structure

Venus has no natural moon. There is no information on the radius of its internal structure. So there no way to apply current method to determine Venus's p{N,n} structure. Since Venus has similar mass and density as Earth, it is expected to have similar p{N,n} system as that of Earth.

VIII. Determine Mars's p{N,n} QM structure

VIII-a. Determine Mars's exterior p{N,n} QM structure by fitting to its moon's orbits, with Mars's surface as p{0,1}RF

Table 7a. Determine Mars 's p{N,n} QM structure by fitting to its moon's orbits, with Mars 's surface as p{0,1}RF. All {N,n} in this table means p{N,n}.

pFactor =			8		6		5		4		3		2	
p{0,1}RF, r1=			3.40E+06		3.40E+06		3.40E+06		3.40E+06		3.40E+06		3.40E+06	
{1,1}, r=r1*pFactor^2			2.17E+08		1.22E+08		8.49E+07		5.43E+07		3.06E+07		1.36E+07	
{2,1}, r=r1*pFactor^4			1.39E+10		4.40E+09		2.12E+09		8.69E+08		2.75E+08		5.43E+07	
{3,1}, r=r1*pFactor^6			8.90E+11		1.58E+11		5.31E+10		1.39E+10		2.48E+09		2.17E+08	
	mass, kg	orbit rn	n= $sqrt(r_n/r_1)$		n= $sqrt(r_n/r_1)$		n= $sqrt(r_n/r_1)$		n= $sqrt(r_n/r_1)$		n= $sqrt(r_n/r_1)$		n= $sqrt(r_n/r_1)$	
Mars	6.417E+23	3.40E+06	1.00	{0,1}	1.00	{0,1}	1.00	{0,1}	1.00	{0,1}	1.00	{0,1}	1.00	{0,1}
Phobos	1.08E+16	9.38E+06	1.66		1.66		1.66	{0,2}	1.66		1.66		0.83	{1,0.8/2}
Deimos	2.00E+15	2.35E+07	2.63		2.63		2.63	{0,2}	2.63		2.63		1.31	{1,1.3/2}

Note: Data of Mars's internal and external structure was obtained from wiki "Mars", or "moons of Mars".

Result: p{N,n//2} will be the good one if Phobos and Deimos will merge in the future.

VIII-b. Determine Mars's interior p{N,n} QM structure by fitting to its internal structure, with Mars's surface as p{0,1}RF

From wiki "Mars", "*Current models of its interior imply a core region about 1,794 km in radius*".

Table 7b. Determine Mars 's p{N,n} QM structure by fitting to its internal structure, with Mars 's surface as p{0,1}RF. All {N,n} in this table means p{N,n}.

pFactor =		8		6		5		4		3		2	
p{0,1}RF, r1=		3.40E+06		3.40E+06		3.40E+06		3.40E+06		3.40E+06		3.40E+06	
{-1,1}, r=r1/pFactor^2		5.31E+04		9.43E+04		1.36E+05		2.12E+05		3.77E+05		8.49E+05	
{-2,1}, r=r1/pFactor^4		8.29E+02		2.62E+03		5.43E+03		1.33E+04		4.19E+04		2.12E+05	
{-3,1}, r=r1/pFactor^6		1.30E+01		7.28E+01		2.17E+02		8.29E+02		4.66E+03		5.31E+04	
	orbit rn , m	n= pFactor*sq rt(r_n / r_1)		n= pFactor*sq rt(r_n / r_1)		n= pFactor*sq rt(r_n / r_1)		n= pFactor*sq rt(r_n / r_1)		n= pFactor*sq rt(r_n / r_1)		n= pFactor*sq rt(r_n / r_1)	
Mars	3.40E+06	8.00	{0,1}	6.00	{0,1}	5.00	{0,1}	4.00	{0,1}	3.00	{0,1}	2.00	{0,1}={0,2}
core	1.80E+06	5.82		4.37		3.64		2.91	{-1,3/4}	2.18	{0,2/3}	1.46	{-1,1.5/2}

No obvious pfactor can be obtained.

VII-c. Mars's p{N,n} QM structure has been severely perturbed, probably by its neighbor Jupiter

No obvious pfactor can be obtained. Both p{N,n//2} or p{N,n//3} seems to be possible candidates. Mars's p{N,n} QM structure has been severely perturbed, probably by 1) its neighbor Jupiter, 2) the expanding ice-evap-line passed {1,6} space and stripped off most of Mars' mass, or 3) both. Mars orbit's relatively low inclination and eccentricity implies that Mars may have accreted most part of mass in orbit space of {1,6}o. The reason why Mars is so small in mass and size will be discussed using p{N,n} interior QM analysis in section X (and in my previous paper SunQM-1s1).

IX. Determine Mercury's p{N,n} QM structure

IX-a. Determine Mercury's exterior p{N,n} QM structure by fitting to its moon's orbits, with Mercury's surface as p{0,1}RF

Mercury has no natural moon. Because Mercury is too close to the rock-evap-line, its crust and even part of the mantle could have been stripped away by the heat of Sun.

IX-b. Determine Mercury's interior p{N,n} QM structure by fitting to its internal structure, with Mercury's surface as p{0,1}RF

From wiki "Mercury"', "*Research published in 2007 suggests that Mercury has a molten core. Surrounding the core is a 500–700 km mantle consisting of silicates." "Based on data from the Mariner 10 mission and Earth-based observation, Mercury's crust is estimated to be 100–300 km thick*" So Mercury's core is about 600km below the surface.

Table 8. Determine Mercury's p{N,n} QM structure by fitting to its internal structure, with Mercury's surface as p{0,1}RF.

pFactor =		8		6		5		4		3		2	
p{0,1}RF, r1=		2.44E+06		2.44E+06		2.44E+06		2.44E+06		2.44E+06		2.44E+06	
{-1,1}, r=r1/pFactor^2		3.81E+04		6.78E+04		9.76E+04		1.52E+05		2.71E+05		6.10E+05	
{-2,1}, r=r1/pFactor^4		5.95E+02		1.88E+03		3.90E+03		9.53E+03		3.01E+04		1.52E+05	
{-3,1}, r=r1/pFactor^6		9.30E+00		5.23E+01		1.56E+02		5.95E+02		3.35E+03		3.81E+04	
	orbit rn , m	n= pFactor*sq rt(r_n / r_1)		n= pFactor*sq rt(r_n / r_1)		n= pFactor*sq rt(r_n / r_1)		n= pFactor*sq rt(r_n / r_1)		n= pFactor*sq rt(r_n / r_1)		n= pFactor*sq rt(r_n / r_1)	
Mercury surface	2.44E+06	8.00	{0,1}	6.00	{0,1}={-1,6}	5.00	{0,1}	4.00	{0,1}	3.00	{0,1}	2.00	{0,1}={-1,2}
Mentle	2.40E+06	7.94		5.95		4.96		3.97	{-1,2/4}	2.98		1.98	{-1,1/2}
core	1.80E+06	6.87		5.15	{-1,5/6}	4.30		3.44	{-1.1/4}	2.58		1.72	

Result: No obvious pfactor can be obtained.

IX-c. Mercury's p{N,n} QM structure has been severely perturbed, probably by its neighbor Sun

No obvious pfactor can be obtained. Although p{N,n//2} could be possible candidate. Two possible reasons that why Mercury is so small in comparison to other planets (Note: wiki "Mercury" showed the similar ideas even before I start to think about this problem):

1) Like that Pluto is only partial mass in orbit space of {2,6}o, so Pluto's orbit has high inclination and eccentricity, while Kuiper belt has the whole mass of orbit space of {3,1}o, so it has averaged low inclination and eccentricity, Mercury orbit's high inclination and eccentricity also implies that Mercury must have accreted only partial mass in orbit space of {1,3}o. Most of the pre-planets in the shell of {1,3}o must have lost (into the Sun) during accretion (due to they were too close to the Sun).

2) Mercury formed at the early phase of Sun's hydrogen fusion, when the heat produced by the early Sun was significantly weak, so the rocky-evep-line was much close to Sun than now. So the initial Mercury had much larger mass (mostly the light-weight solids or even some ice) than now even it accreted only part of mass in shell space of {1,3}o. Then during last 4 billion years, Sun was getting matured, the heat produced by the hydrogen fusion increased, the rocky-evap-line expanded outward to around or beyond {1,2} now, so (ice, even some light-weight solids) mass in shell space of {1,3}o start to get evaporated. All of those small planetesimal bodies got completely evaporated. The most large one, Mercury, got its outer crust and part of the mantle striped off by the rocky evaporation. Whatever left becomes today's Mercury.

The 2nd reason actually messed up Mercury's p{N,n} QM system. If this hypothesis is correct, and if the formation of Mercury was governed by the p{N,n//2} QM system, then it could have the r of 4× of current core's r, which is ~7.2E+6 meters. This means the initial Mercury had a size (and mass) almost same as that of Earth.

X. Extracting the common character from planet's p{N,n} analysis produced a general QM model of {N,1//2} (with N = -1, 0, 1) for all originally formed planets

After analyzed all 8 planets using the p{N,n} QM structure, we can see that in general only very massive celestial body will have clear result of {N,n}. The super massive Sun has a {N,n//6} system, and its QM effect can reach up to {5,1}. The massive Jupiter has a p{N,n//5} system, and its QM effect can only reach up to p{1,1//5}. Earth is luckily has its QM effect up to p{3,1//2}. The rest planets have their QM effect so weak (or the perturbation so strong) that their moons movement are significantly deviated from their p{N,n} orbits. So the general pattern of planet's p{N,n} is: p{0,1}RF at planet's surface, a few major moons in orbit p{0,n=2..pFactor}, the most outside major moon takes p{1,1}o orbit, and there is an inner core at p{-1,1}RF.

But the positive side of this analysis is, after knowing Solar system's formation is governed by the {N,n//6} QM effect, now we have the evidence that the planet's formation is also governed by the p{N,n} QM effect. If this conclusion is correct, then the inner core of each planet should have been formed under the interior QM of the same p{N,n} QM effect, which means if we know the size of its inner core, we can deduce out the original surface size of the planet when it was initially formed. For example, if Mercury's inner core r = 1.8E+6 meters is correct, then its initial surface should have r = 7.2E+6 meter under p{N,n//2} interior QM. So the current Mercury must have its crust and part of mantle stripped off (by Sun's rock-evap-line).

Here is the 2nd example, if Mars' inner core r = 1.8E+6 meters is correct, and if it was formed under p{N,n//2} interior QM, then its initial surface could also have r = 7.2E+6 meter. So the current Mars must also have its up-layer stripped off. Since Sun's rock-evap-line (currently at {1,2}) is far away from Mars, but Sun's ice-evap-line (currently at {1,8}) just passed Mars, therefore the stripped off material on the old Mars' up layer must be hydrogen & ice (or water). So if this analysis is correct, then Mars must have been formed under the young Sun (with ice-evap-line way smaller than {2,1}). Its initial size (and mass) was close to that of Earth's. Its surface was covered by ice (or water) as deep as 5.4E+6 meters. When

Sun get matured, its ice-evap-line expanded and passed the Mars, all water on Mars was evaporated, fly outward, mostly captured by Jupiter. Or in QM word, all water matter on Mars surface was excited and transitioned from {2,1}o orbit state to a higher excitation orbit state at {2,2}o. The left over rocky core become the current Mars.

After studied p{N,n} QM structure for all planets, I feel that I can extract some common characters from section I to IX:

1) Venus' r (= 6.05E+6 m) is very close to Earth's r (= 6.38E+6 m).

2) If Mercury core {-1,1}RF 's r = 1.80E+6 m is correct, then its main body p{0,1}RF size (r = 7.2E+6 m) should also similar to Earth's size.

3) The ratios of r_{Uranus} / r_{Earth} = 4.0, $r_{Neptune}$ / r_{Earth} = 3.9, r_{Saturn} / r_{Earth} = 9.4, and $r_{Jupiter}$ / r_{Earth} = 11.2, so that if based on Earth's surface as p{0,1}, then Uranus and Neptune's surface will have p{0,2} in size, Saturn's surface will have p{0,3} in size, Jupiter's surface will have close to p{0,4} in size (see column 5 of Table 9).

4) If assign the main body of Uranus and Neptune as p{0,1}RF, then both of them have a core p{-1,1//2} at the size comparable to Earth's main body size (r = 6.38E+6 m).

All these r values are related to Earth's p{0,1}, and p{-1,1} structures. This leads me to propose a general model of an un-disturbed planet formation (in Solar system) under p{N,n} QM: When a planet is formed (undisturbed), it should have accreted all mass in its orbit shell space, so its orbit has zero eccentricity and zero inclination. The planet main body p{0,1}RF is made of rock for rocky planets (or ice/rock mixture for gas/ice planets), and it has size comparable to Earth (it may have 0.5× ~ 5× variation range in mass, or 0.8× ~1.7× variation range in r, see the original mass for planets in paper SunQM-1s1, Table 3b). Inside it, a core with r = 0.25× will be formed with iron for rocky planets (or rock/Fe mixture for gas/ice planets), make the core to be a p{-1,1//2} QM structure. Outside it, a thick hydrogen atmosphere (or liquid hydrogen) with r = 3× (so total r = 4×) will be formed, make the atmosphere to be the p{1,1//2} QM structure. In this way, if not perturbed, all 8 planets were originally made of a p{1,1} atmosphere, a p{0,1} main body, and a p{-1,1} core, with pfactor = 2, and the main body r comparable to Earth's r. According to this model, I reconstituted the original planets' atmosphere p{1,1}, main body p{0,1}, and core p{-1,1} in Table 9.

Table 9. Reconstitute the original planets' atmosphere p{1,1}, main body p{0,1}, and core p{-1,1}.

planet's current data								atmosphere p{1,1//2}	main body p{0,1//2}	core p{-1,1//2}	
	mass	planets body-r	body-r ratio to Earth	n= sqrt(rn/r1), r1=Earth	original planet mass	mass ratio, Mp{N,n}/ M{N,5}	assumed original mass density	r= [M/(D*4/3 *π)]^(1/3)	$r_{p\{0,1\}}$= $r_{p\{1,1\}}$/4	$r_{p\{-1,1\}}$= $r_{p\{0,1\}}$/4	pFactor, n=sqrt(rn/r1) r1=p{-1,1}
unit	kg	m	m/m		kg	kg/kg	kg/m^3	m	m	m	
Sun core		1.74E+08	27.3	5.2							
SUN	1.99E+30	6.96E+08	109.1	10.4							
{1,2}					5.22E+26	3.5	3340	3.34E+07	**8.35E+06**	2.09E+06	
{1,3} Mercury	3.30E+23	2.44E+06	0.4	0.6	3.04E+26	2.1	3340	2.79E+07	**6.98E+06**	1.74E+06	1.18
{1,4} Venus	4.87E+24	6.05E+06	0.9	1.0	2.05E+26	1.4	3340	2.45E+07	**6.12E+06**	1.53E+06	1.99
{1,5} Earth	5.97E+24	6.38E+06	1.0	1.0	1.48E+26	1.0	3340	2.20E+07	**5.49E+06**	1.37E+06	2.16
{1,6} Mars	6.42E+23	3.40E+06	0.5	0.7	1.16E+26	0.8	3340	2.02E+07	**5.06E+06**	1.26E+06	1.64
{2,2} Jupiter	1.90E+27	6.99E+07	11.0	3.3	1.92E+26	3.5	1326	3.26E+07	**8.14E+06**	2.04E+06	5.86
{2,3} Saturn	5.68E+26	5.82E+07	9.1	3.0	1.11E+26	2.0	1326	2.71E+07	**6.78E+06**	1.70E+06	5.86
{2,4} Uranus	8.68E+25	2.56E+07	4.0	2.0	7.52E+25	1.4	1326	2.38E+07	**5.96E+06**	1.49E+06	4.14
{2,5} Neptune	1.02E+26	2.48E+07	3.9	2.0	5.46E+25	1.0	1326	2.14E+07	**5.36E+06**	1.34E+06	4.30

In Table 9, column 2 and 3 is the known data (from wiki, or NASA's Planetary Fact Sheet). Column 4 calculates the r ratio relative to Earth's surface r, and column 5 is the n = sqrt(r_{planet} / r_{Earth}). Notice that Uranus and Neptune have relative n = 2, and Saturn has relative n = 3. Column 6 the "original planet mass" is copied from my previous paper (SunQM-1s1, Table 3b, column 10). Column 7 shows the mass ratio of {N,n} vs. {N,5}. Notice that for {1,n=2..6}o orbits, they are 3.5×, 2.1×, 1.4×, 1×, 0.8× of Earth mass. For {2,n=2..5}o orbits, they are 3.5×, 2.1×, 1.4×, 1× of Neptune mass.

Now I have the original planet's mass, I need to obtain the original planet's body r. To do this I need to know original planet's mass density. In column 8 "assumed original mass density" (which we do not know), I assumed that all

{1,n=2..6} orbited planets have Moon's density = 3340 kg/m^3, and all {2,n=2..6} orbited planets have Jupiter's density = 1326 kg/m^3. In column 9, planets' original body-r is calculated as r = [M/(D*4/3*π)]^(1/3), where M = planet's original mass, D = planet's original mass density. The calculated r is the original planet's atmosphere size p{1,1//2}. Notice that it does match the (atmosphere) sizes of Uranus and Neptune. In column 10, planets' original main body-r at p{0,1//2} is calculated as 0.25× of its atmosphere's r. Notice that it (roughly) matches the size of Earth, (and close to Venus' r). It also (roughly) matches the core of Uranus and Neptune. In column 11, planets' original core-r at p{-1,1//2} is calculated as 0.25× of its main body's r. Notice that it (roughly) matches the core size of Earth and Mercury. In column 12, a new n is calculated by using planets' current surface r against the p{-1,1} as r_1.

With known planet's original (calculated) mass, size and p{N,n} QM structure, now I try to explain what make them to become today's planet. Note: for the four gas/ice planets, let us rename the p{0,1} QM structure as Earth-sized core, and p{-1,1} QM structure as inner core.

1) Neptune still keeps the original atmosphere p{1,1//2}, original p{0,1//2} Earth-sized core, and original p{-1,1//2} inner core QM structures, even its moons also shows strong p{N,n//2} QM structure. (Note: in Table 4a & 4b, Neptune's atmosphere is set to p{0,1}. Now the Neptune's Earth-sized core is set to p{0,1}). We can also use the inner core p{-1,1} as r_1 with pfactor = 4 to describe Neptune's {N,n} QM structure. In this situation, the Earth-sized core is at p{-1,2//4}, the Neptune surface is at p{-1,4//4} = p{0,1//4}, the moon Triton is at p{1,1//4}o orbit, the moon Nerid is at p{2,1//4}o orbit.

2) Uranus still keeps the original atmosphere p{1,1//2}, original p{0,1//2} Earth-sized core, and original p{-1,1//2} inner core QM structures. However its exterior moons' p{N,n} structure has been messed up due to it had been hit by other celestial body. (Note: in Table 5a & 5b, Uranus' atmosphere is set to p{0,1}).

3) Jupiter captured ~78% mass of hydrogen and ice from Sun's {1,n=2..6} super-shell, and add to its atmosphere, therefore increased its mass from 10% to 100% (see Table 2 in paper SunQM-1s1). This transformed Jupiter from the original {N,n//2} QM structure into a new {N,n//5} QM structure. And this causes its exterior moons follow the p{N,n//5} QM structure. (Note: in Table 1a & 1b, Jupiter' atmosphere is set to p{0,1}).

Here I give a possible explanation of how Jupiter transformed its original p{N,n//2} QM structure into a current p{N,n//5} QM structure. Jupiter's original p{-1,1}RF inner core, p{0,1} Earth-sized core, and p{1,1} atmosphere shell were 100% mass occupied (for mass occupancy theory, see my paper SunQM-3s1, section IV, for detail). The newly captured mass added to the outside of p{1,1} shell make its r increased to ≈ 6.99E+7 m, or n = sqrt(6.99E+7/1.01E+7) = 2.6, so it become a p{1,2.6//2} QM structure based on its Earth-sized core p{0,1//2} as r_1. Since a p{1,2.6//2} out shell's QM does not match its p{0,1//2} core's QM, the whole system is looking for a standard p{N,n//pfactor} QM system, and pfactor = 5 is almost perfect for it. So Jupiter transformed its interior QM p{N,n} structure from p{N,n//2} into p{N,n//5} (probably by temporarily melting the mass at interface between each level of inner cores and then resizing them. The melting was driven by high G-force caused compression & fraction force produced heat between two different levels of cores). For example: Jupiter's inner core p{-1,1} has a spin angular velocity $\omega_{p\{-1,1\}}$, its Earth-sized core p{0,1} shell has $\omega_{p\{0,1\}}$. (For a central-G-force caused QM ω_n theory, see my paper SunQM-3s1 section I-b). At the interface of two angular velocities, the fraction produced high heat, and melted the mass. This allow the p{N,n} QM force to re-adjust the r of interface to change from p{N,n//2} to p{N,n//5}. Besides that, its original atmosphere p{1,1//2} r = 3.26E+7 m, original p{0,1//2} r = 8.14E+6 m, and original inner core p{-1,1//2} r = 2.04E+6 (see Table 9), are not too far away from its current p{-1,4//5} core r = 2.8E+6 *4^2 = 4.48E+7 m, p{-1,2//5} core r = 2.8E+6 *2^2 = 1.12E+7 m, and p{-1,1//5} core r = 2.8E+6 m (see Table 1b, column 5). (Note: the model's parameters are very rough. If I adjust them a little bit, the resulted two sets of data can be very close). This helped to decrease the transition energy barrier between these two QM systems (like the chemical reaction's transition state theory) for Jupiter. In this way, Jupiter successfully transformed from p{N,n//2} into p{N,n//5} QM structure.

4) Saturn captured ~22% mass of hydrogen and ice from Sun's {1,n} super-shell, and add to its atmosphere, therefore increased its mass from 20% to 100% (see Table 2 in paper SunQM-1s1). However, its original Earth-sized core p{0,1//2} r = 6.78E+6 m, and inner core p{-1,1//2} r = 1.7E+6 (see Table 9) still remains there. The newly added hydrogen increased the atmosphere from p{1,1//2} = p{0,2//2} size into p{0,3//3} size (if use the Earth-sized core p{0,1//2} as p{0,1//3}, calculated

as sqrt(5.82E+7 / 6.78E+6) = 2.93). This causes the total body p{N,n}'s pfactor neither a pure = 2, and nor a pure = 3, so it messed up the pfactor for Saturn's p{N,n} QM structure. And this caused Saturn's moons do not know whether they should follow p{1,n//2} QM orbits or to follow p{1,n//3} QM orbits (see Table 6a). (Note: in Table 6a & 6b, Saturn' atmosphere is set to p{0,1}). As the result, Saturn's biggest moon Titan still follow the p{1,1//2} QM structure. At beginning, I believed that the current (extraordinary low) mass density of Saturn was formed after a collision not too long time ago, and Saturn's size has been continually shrinking since then. After p{N,n} QM structure analysis and mass occupancy analysis, now I believe the following situation may also be possible for Saturn:

The current Saturn has a Earth-sized core p{0,1//2} and a inner core p{-1,1//2}, both with 100% mass occupancy and p{N,n//2} QM structure, but it has a p{0,3//2} sized atmosphere. The atmosphere from p{0,1//2} to p{0,2//2} (or p{0,1//2}o orbit space) has 100% mass occupancy. But the atmosphere from p{0,2//2} to p{0,3//3} has only ~50% mass occupancy. If it had have 100% mass occupancy in atmosphere, it would have generated enough G-force compression to transform its core from {N,1//2} QM to {N,1//3} QM, so that the whole Saturn would have become a {N,n//3} QM structure. However, current Saturn's ~50% mass occupancy in n = 3 shell is not enough to make this transformation, so it is trapped at this hybridized (core base-2, atmosphere base-3) QM state. This is like in a sequential chemical reactions, the reaction is trapped in an intermediate state, not the final state. Or in a receptor-drug binding (computer) modeling, the minimization of bind energy is trapped in the local minimum, not the global minimum. If this explanation is correct, then this hybridized intermediate QM state might happen at 4 billion years ago, and it may last for another 5 billion years.

5) Earth lost all its atmosphere p{1,1//2} shell (affected by ice-evap-line), but kept its original main body p{0,1//2} and original core p{-1,1//2} intact. Its exterior moon also follow p{N,n//2} QM structure.

6) Venus lost all its atmosphere p{1,1//2} shell (affected by ice-evap-line), but kept most part of its original main body p{0,1//2} and all part of its original core p{-1,1//2}.

7) Mars lost not only all its atmosphere p{1,1//2} shell (affected by ice-evap-line), but also most part of its original main body p{0,1//2} because it was made of deep water. So only small part of its main body and all part of its original core p{-1,1//2} left. Mars small mass exert weak p{N,n//2} QM effect to its exterior moons, although the averaged orbit of two moon still follows roughly a p{N,n//2} orbit.

8) Mercury lost not only all its atmosphere p{1,1//2} shell, but also most part of its original main body p{0,1//2} because of the rock-evap-line. So only small part of its main body and all part of its original core p{-1,1//2} left.

9) {1,2} orbited planet (if it had been formed) lost not only its atmosphere p{1,1//2} and main body p{0,1//2}, but also all of its core p{-1,1//2} because of the rock-evap-line passed it. So it is completely evaporated.

10) Note: Above discussion assumed that in Solar system's each n shell, all mass accreted into a planet first, and the expansion of ice-evap-line happened afterward. It is possible that the ice-evap-line expanded before the planets had formed, or both happened at same time. If so, the process will be somehow different, but the result is almost same.

11) Why the standard size of main body of the originally formed planet has a Earth size? Probably it is because Earth size is very close to ΔN = -1 of Sun core's size, or the white dwarf's size. So in Solar system, not only planet's orbit follows {N,n//6} QM, but planet's size also follow {N,n//6} QM !

12) If this model is correct, then for all four gas/ice planets, we can know that they have not only Earth-sized core at {0,1}, but also a inner core at size of {-1,1}.

XI. The limitation of using Planet's interior p{N,n} QM for meter-sized objects due to the internalized r_1

Now I have one interesting question: if I sit in a deep space, without any G-force perturbation other than myself, and I wrap myself like a ball, does my ball-shaped human body produce any effective gravitational QM effect at outside of my body-ball (like Earth make a satellite moving around it)?

A 65 kg human ball ≈ 65 kg's water ball (D=1000kg/m^3), calculated surface r = (M/(D*4/3*π))^(1/3) = (65/(1000*4/3* π))^(1/3) = 0.25m. Suppose shrink this human ball to a point mass, and use a one gram Ping-Pong ball (also shrink to a point mass) to orbit it under G-force at orbit-r = 0.25 meter. then this orbit-r can be described by many {N,n} QM orbits (like that the Earth's orbit can be described by {1,5}o, or {2,5}o, or {4,5}o orbit, see SunQM-2). If we use Planck constant h, then its r_1 = [h/(m2π)]^2 /(GM) =2.56E-54 m. So its r_1 is internalized into the r-surface (under h)! Its $r_{surface}$ has n = sqrt(r_n/r_1) = 3.1E+26.

Now if we put two Ping-Pong balls circularly orbiting human ball at r = 0.25 * 2^2 =1 meter, and r = 1 * 2^2 = 4 meters, then this human-ball / Ping-Pong balls system apparently forms a {N,n//2} QM structure. Or if we put four Ping-Pong balls circularly orbiting human ball at r = 0.25 * 2^2 = 1 meter, r = 0.25 * 3^2 = 2.25 meters, r = 2.25 * 2^2 = 9 meters, and r = 2.25 * 3^2 = 20.25 meters, then this human-ball / Ping-Pong balls system apparently forms a {N,n//3} QM structure. So the pfactor of this {N,n} QM system can be any value (as we forced it to be).

But this {N,n} QM system will never be formed under the solely G-force governed mass collapse. For 65 kg of water molecules (= 65(kg) *6.022E+23 / 0.018(kg/mol) = 2.17E+27 molecules) in a local region of deep space, under G-force governed mass collapse, they will form a water (or ice) ball at $r_{surface}$ ≈ 0.25 meter. But this $r_{surface}$ is not formed by the G-force, it is formed by the hydrogen-bond force, a residue force of atom's EM-force. If there was no hydrogen-bond force but only G-force between water molecules, then it would have much smaller r value than 0.25 meter, or its true gravity r_1 << 0.25 meter. So the gravity r_1 is internalized comparing to $r_{surface}$ = 0.25 meter. Because of this reason, 2.17E+27 water molecules formed water ball will not form a {N,n//2} QM structure with orbit r at 1 meter and 4 meters. This conclusion is true even for a 1E+6 kg rocky ball, because its $r_{surface}$ value is dominated by the chemical bond force, van der Waals force, etc. not solely by the G-force, so its gravity r_1 << $r_{surface}$.

Through this analysis, we can see the limitation of {N,n} QM is that it is suitable only for the primary forces, or single point open force (like G-force, or EM-force as shown in paper SunQM-2) formed structure, it is not suitable for the secondary force (like chemical bond force, van der Waals force, hydrogen-bond force, etc) formed solid (or condensed matter) structure. So {N,n} QM is not suitable for our daily-life world's meter-sized objects. The G-forced {N,n} QM structure only formed for those objects that have mass large enough so that their $r_{surface}$ value is dominated the G-force, not by the chemical bond force, van der Waals force, etc.

In paper SunQM-5, I also studied the EM-force caused {N,n} QM effect for meter-sized object. I spend so much effort to study the meter-sized carbon (or H_2O) ball's {N,n} QM, simply because I am a biophysicist. So I interested in human body's {N,n} QM more than the celestial body's {N,n} QM.

Conclusion

1) All eight planets have been analyzed by using exterior and interior {N,n} QM model, but only three planets' p{N,n} can be clearly determined. It is p{N,n//5} for Jupiter, p{N,n//2} for both Earth and Neptune.

2) A general p{N,n//2} QM structure model is proposed, which is suitable for all 8 planets when they were originally formed.

3) There is a mass limitation for using planet interior p{N,n} QM, and it is due to the internalized r_1 (or $r_1 < r_{surface}$) effect. So the G-forced {N,n} QM analysis is not suitable for daily-world-sized object.

References

[1] A series of my papers that to be published (together with current paper):
SunQM-1: Quantum mechanics of the Solar system in a {N,n//6} QM structure.
SunQM-1s1: The dynamics of the quantum collapse (and quantum expansion) of Solar QM {N,n} structure.
SunQM-1s2: Comparing to other star-planet systems, our Solar system has a nearly perfect {N,n//6} QM structure.
SunQM-1s3: Applying {N,n} QM structure analysis to planets using exterior and interior {N,n} QM.
SunQM-2: Expanding QM from micro-world to macro-world: general Planck constant, H-C unit, H-quasi-constant, and the meaning of QM.
SunQM-3: Solving Schrodinger equation for Solar quantum mechanics {N,n} structure.
SunQM-3s1: Using 1st order spin-perturbation to solve Schrodinger equation for nLL effect and pre-Sun ball's disk-lyzation.
SunQM-3s2: Using {N,n} QM model to calculate out the snapshot pictures of a gradually disk-lyzing pre-Sun ball.
SunQM-3s3: Using QM calculation to explain the atmosphere band pattern on Jupiter (and Earth, Saturn, Sun)'s surface.
SunQM-3s6: Predict radial mass density distribution for Earth, planets, and Sun based on {N,n} QM probability distribution.
SunQM-5: C-QM (a new version of QM based on interior {N,n}, multiplier n', |R(n,l)|^2 |Y(l,m)|^2 guided mass occupancy, and RF) and its application from string to universe.
SunQM-5s1: White dwarf, neutron star, and black hole re-analyzed by using C-QM.

[2] The citation of wiki "Solar core" means it is obtained from the Wikipedia online searching for "Solar core". Its website address is: https://en.wikipedia.org/wiki/Solar_core. This website address can be generalized for all other searching items.

[3] Major QM books, data sources, software I used for this study are:
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