Did the proto-gas planets' core lose mass before their final formation? Did β-decay of neutrons occur?

by using the Solar Protuberance Hypothesis and the Maxwell Analogy for Gravitation.

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Summary

Our gas planets and our core planets are formed as two groups from one solar protuberance. It appears that the ionized hydrogen (protons) generated the gas planets[2][3] and the corresponding amount of electrons generated the core planets[4][5]. In this paper, we will discuss the hypothesis that the order sequence of the proto- gas planets that we found[3] could imply that the neutrons that were involved in the process of the solar protuberance, possibly got β^- - decay. This hypothesis gives a probability fit of 99,7%. We also analyze the hypothesis that a part of the proto-gas planets' core mass got lost during the formation of the gas planets. For the latter hypothesis, we find a probability fit of 99,99%.

Keywords: *gas planets, neutrons, ionization, polarization.*
Method: *analytical.*
Notation: *decimal comma.*

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1. *Pro memore* : The solar protuberance.

The Titius-Bode law – The orbits of the planets are spread according a simple law.

In the paper "*The Titius-Bode law shows a modified proto- gas-planets' sequence*"[3], it appeared that the planets were probably born out of the sun due to a huge electromagnetic protuberance. A part of it, containing screwing ionized gazes, has been following an magnetic force line coming out of the sun, and was mainly composed of hydrogen and helium, supposed to be mainly electrically charged (ions). Thus, a spirally wound set of ring-segments arose from the sun, was then fractioned into proto-planets and finally became a set of planets.

The gas-part and the core-part – Basic concept

The protuberance was a solar eruption in which all types of the planets' atoms were already present. It caused the ejection of matter, about 0,15 % of the sun's total mass, at a speed of about 10^5 m/s for the proto-gas planets.

The hypothesis of a solar protuberance implies that the planets were created from one eruption only, but consisted of two (successive or simultaneous) eruption shocks: a first eruption shock of mainly hydrogen and some helium at one side of the protuberance (proto-Uranus, -Saturn, -Neptune, -Jupiter)[3], followed by a shock by the amount of electrons[4] (corresponding to the amount of ionized hydrogen of the gas planets) hitting a solar spot at the other side of the electromagnetic force line of that protuberance (proto-Mercury, -Mars, -Venus, -Earth)[5].

Disruption into proto-planets – Basics

How did the protuberance exactly split-up into proto-planets? Therefore we have to look at fig.1.1.

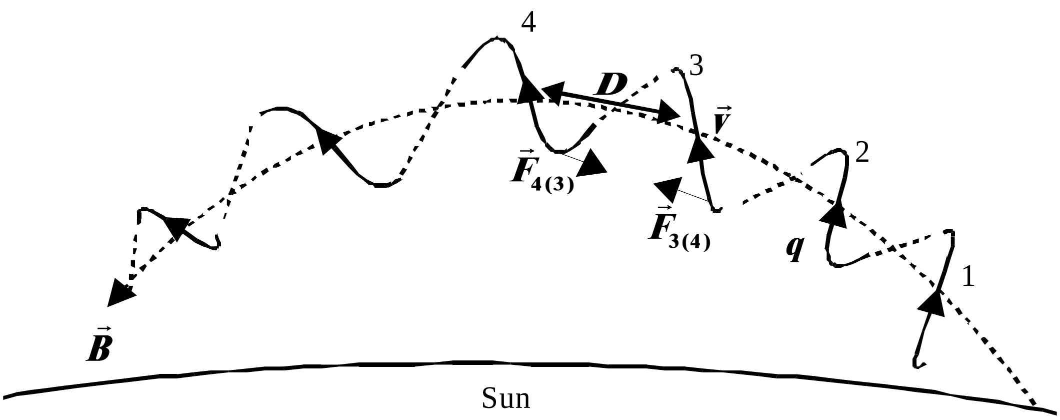

Fig.1.1*: Lorentz forces make the protons and electrons swivel about a magnetic path and Coulomb forces F pull and break apart the zones of the solar protuberance into parts.*

Since there are four gas planets known, I have restricted the number of parts to four, assuming that the gas planets don't influence the core planets formation.
Each part of the screwing hot cloud will undergo a force from the other parts. So, it follows that the cloud will expand in length, allowing the final separation of the parts into proto-planets. The distance ***D*** between each part is assumed to be the same for the whole protuberance. The Coulomb forces will disrupt the ionized screwing cloud into parts and create a steadily decreasing acceleration of the disrupted parts until they get a constant orbital velocity that is strictly related to their orbit radius by the geometrical law $a = v^2 / r$ (for circular orbits).

2. The best fit for the proto-gas-planets.

A perfect fit for the proto- gas planets – *Statistical fit of 100%.*

When I tested the best fit for the proto- gas planets[3], it appeared that the sequence order had to be proto-Uranus, -Saturn, -Neptune and -Jupiter, as shown in table 2.1.

	Proto planets	M [kg] (xE24)	q [C]	F (N)	a [m/s²]	r (xE9)	a/r
			mutually comparative figures only				
1	Jupiter	1899	1899	120417,7	63,41	778,6	12,28
2	Neptune	102	102	-33387,15	-327,33	4495,1	-13,73
3	Saturn	568	568	-69572,9	-122,49	1433,5	-11,7
4	Uranus	86,8	86,8	-17457,65	-201,13	2872,5	-14,28
						X =	**0,997**

Table 2.1 : *The best fit for the proto- gas planets, where 'q' is the electrical charge, 'F' the Coulomb force between the considered proto-planet versus the other proto-planets, ''a the corresponding acceleration, 'r' the actual orbit radius, X the statistical fit indicator. X = 0,997 means a fit of 99,7%.*

Remark the statistical value X for a/r which becomes X = 0,997 . The value X is determinative for the fit of the values between the proto- gas planets' sequence and the actual orbits of the planets.

This is found when applying the statistically based equation:

$$\sqrt{\sum_{i=1}^{4}(a_i/r_i)^2} \Big/ \sum_{i=1}^{4}|a_i/r_i| \qquad (2.1)$$

We can then compare the proto-planets' accelerations and the today's orbital radii. The results can be found by using (2.1) and the values will be situated between 0 (perfect fit) and 0,5 (worst fit). The statistical validity of (2.1) is not proved here and we consider it only as an indicator and a valuation method for the results.

If we want to transform the gradation from 0 (or 0% , worst fit) to 1 (or 100% , perfect fit) we need to use (2.2).

$$X = 2\left(1 - \sqrt{\sum_{i=1}^{4}(a_i/r_i)^2} \Big/ \sum_{i=1}^{4}|a_i/r_i|\right) \qquad (2.2)$$

If the positive sign for a/r in the table 2.1 means a prograde orbit, the negative sign means a retrograde orbit. However, I showed in a former paper[3] that any retrograde orbit swivels into a prograde orbit in time, due to the transmission of the Sun's angular momentum to the surrounding space, by the means of gyro-gravitation[3].

Did we test the proto- planets' sequence correctly? – *All matter was supposed to have been ionized.*

During the study about the proto-gas planets, we have considered that all the matter was ionized, because a major part of the planets is made is hydrogen. But in reality, other chemical element have a considerable weight in the total mass. So, the values of the electrical charge q in the table 2.1 should not be equivalent to the mass (one nucleon for one charge) but to the equivalent number of protons (and no neutrons) related to the mass.

Below, we have shown the chemical composition of the gas planets, where is shown that considerable amounts of neutrons will play no role at all in the electromagnetic solar protuberance.

Element (wt%)	Atomic Mass	Jupiter	Saturn	Uranus	Neptune	Pluto
H	1	*90,00*	*93,00*	*59,00*	*74,00*	
He	2	*10,00*	*3,00*	*10,00*	*22,00*	
Rocky core (estimate)	25		*3,00*	*30,00*	*3,00*	*70,00*
Water	10					*30,00*
Total (wt%)		*100,00*	*99,00*	*99,00*	*99,00*	*100,00*
Total mass (10^{24}kg)		*1899*	*568*	*86,8*	*102*	*0,0125*

Table 2.2 [11] : *A considerable amount of neutrons will play no role at all in the electromagnetic solar protuberance.*

These amounts has to be subtracted from the values of the electrical charge ***q*** in the table 2.1. In the next chapter, we will correct the values and make a very strange discovery.

3. Re-evaluating the gas planets' order.

When we change the electrical charge of the nuclei that content neutrons to half the charge of their equivalent weight, we have to take the hydrogen nuclei for 100% and the other nuclei for approximately 50% to 55% of their weight. Remember, the figures are not absolute, but can be compared mutually.

By doing this, we come to the table 3.1. below. After using the equation (2.2) , we find for the statistical value ***X*** = 0,988 , which means an comparative fit of 98,8%.
No other proto- gas planets' sequence order fits better than that of table 3.1. and the second choice gives us a fit of only 94% (***X*** = 0,94).

	Proto planets	**M [kg] (xE24)**	**q [C]**	**F (N)**	**a [m/s²]**	**r (xE9)**	**a/r**
			mutually comparative figures only				
1	**Jupiter**	1899	1804,05	105283,16	55,44	778,6	14,04
2	**Neptune**	102	88,74	-27480,08	-269,41	4495,1	-16,68
3	**Saturn**	568	548,12	-64506,39	-113,57	1433,5	-12,62
4	**Uranus**	86,8	69,01	-13296,68	-153,19	2872,5	-18,75
						***X* =**	**0,988**

Table 3.1: *The best fit for the proto- gas planets, where 'q' is the electrical charge that is reduced to the number of protons, by deduction of the neutrons, 'F' the Coulomb force between the considered proto-planet versus the other proto-planets, ''a the corresponding acceleration, 'r' the actual orbit radius, X the statistical fit indicator. X = 0,988 means a fit probability of 99%.*

Since here we find 'only' ***X*** = 0,988 whereas in table 2.1 we found ***X*** = 0,997 , it means that the probability of a wrong proto- gas planets' sequence is below 1,2%. And for table 2.1, it is below 0,3%.

Hence, it seems not very realistic that the found values of the charge in table 3.1 are correct, although we tried to find the most reasonable correction to the table 2.1. But there is another possibility. How sure can we be that all the erupted matter found its way inside the proto-planets?

4. The hypothesis of the lost matter.

When the solar protuberance took place, the ionized matter screwed about a magnetic path. All the matter wasn't however ionized : the neutrons didn't ionize and the larger and heavier the atoms, the less percentage protons occur and the less nucleons are ionized. That made these nuclei screw much farther away from the magnetic path due to the larger inertial mass compared to the Lorentz force that acts on the nuclei.
It might be possible that the heaviest particles haven't been cached by the proto-planets and got lost in space.

If we consider that the planets' cores were 50% larger than they are in the final planets, we get the table 4.1. In that table, we have taken the electrical charge to be 100% of the hydrogen and 50% of the core.

	Proto planets	M [kg] (xE24)	q [C]	F (N)	a [m/s²]	r (xE9)	a/r
			mutually comparative figures only				
1	**Jupiter**	1899	2074,66	148934,21	78,43	778,6	9,93
2	**Neptune**	102	123,35	-44440,15	-435,69	4495,1	-10,32
3	**Saturn**	568	605,67	-80337,67	-141,44	1433,5	-10,14
4	**Uranus**	86,8	111,44	-24156,4	-278,3	2872,5	-10,32
						***X* =**	**0,9999**

Table 4.1: *The best fit for the proto- gas planets, where the mass of the core has been augmented with 50% and 'q' is the electrical charge that is reduced to the number of protons, by deduction of the neutrons, 'F' the Coulomb force between the considered proto-planet versus the other proto-planets, ''a the corresponding acceleration, 'r' the actual orbit radius, X the statistical fit indicator. X = 0,9999 means a fit probability of 99,99%.*

This result suggests that a part of the core could have been lost (in our example of table 4.1 : 33%) during the formation of the planets, while it was present at the solar eruption.

5. Discussion and conclusion.

The analysis of the solar protuberance was firstly done while considering that all the mass could have been ionized during the formation of the proto- gas planets. This gave a fit of 99,7%. The consequence of this assumption is that also the neutrons of the protuberance could have been ionized for a short time (β^- - decay) and maybe rearranged into nuclei by electrons capture, because afterwards, some core has been formed in the gas planets, which by definition should contain neutrons for about half the number of their nuclei.
In the second analysis I corrected that and I used only half of the nuclei's masses to find their equivalent number of electrical charge. This gave a less good fit of 98,8%. This is indeed not that far from the 99,7% fit for the case where we used the core mass and the electrical charge in a proportion 1:1.

It is clear that the absolute difference of 0,9% between both results cannot be a worthily support for a totally new theory about neutrons that would admit a β^- - decay of neutrons due to the high temperature and the electromagnetic influence. In order to obtain the actual cores of the gas planets, we would have to assume that there was a rearrangement of the nuclei into protons and neutrons just after the β^- - decay, by the absorption of electrons. Literature however never mentioned β^- - decay and spontaneous re-caption of electrons by protons in nuclei. The best neutrons can do is to polarize.

But we also fixed two parameters that are used for calculating the fitting, which also could influence the result.
In the first place, we consider that the four proto- gas planets were equidistant, which is not certain. In a former paper concerning the core-planets, we have introduced a smaller distance between two proto-planets and we have got a better fit. This however made us play with parameters for a better fit, which is at least a suspicious method.
The second parameter concerns the following: we don't know to what extend the acceleration decrease evolved while the proto-planets began to mutually expand under the Coulomb forces. The values of the initial accelerations are not a full guarantee for the final values of the orbit radii.

From one thing we can be quite sure, the fit of the found proto- gas planets' original sequence order proto-Uranus, -Saturn, -Neptune, -Jupiter appears to be quite stable, even if small variations of the parameters are introduced.

At the other hand, would it have been better if we had found a fit of only, say 95%, for the table 3.1?
Probably it would made us believe that the neutrons really did short-time "ionize", but even then, an accidental fit of the figures still would have been possible, due to the two remaining parameters that could differ from our assumptions.

I conclude that, however very unlikely, a possible "ionization" of neutrons in the solar protuberance can be examined according an assumed strength of the magnetic field and a very high temperature.

In the second hypotheses, which is much more likely, I increased the original mass of the proto-planets' core with 50%, while keeping the non-hydrogen ionization to 50% and I came to a fit level of 99,99%. This result suggests that the cores have lost nearly 30% of their weight into space during the formation of the planets. The asteroids, the moons and the planets' rings are only a part of that loss. Of course, the figures we found are only indications of possible hypotheses that merit to be analyzed further. They are no proof by themselves.

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