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On the unexplained density of exoplanet TrES-4.

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1. Discovery of the exoplanet TrES-4.

The exoplanet TrES-4 has been discovered in 2007. Its density is 0.24 gr/cm³ and its diameter is 1.7 times that of Jupiter. The orbital radius is $7.3.10^9$ m and the orbital period is 3.5 days about a star which has a mass of 1.2 $M_\odot$. It is not known why such low-density planets can exist. Low-density planets should quickly become more dense, due to gravitation.

2. The eruption hypothesis.

One of the possible explanations is that the exoplanet TrES-4 is hollow. That means that the overall density could exist together with a large diameter. The conditions for such a hollow planet are given by the hypothesis that the planet is formed by an eruption of the star. Less than 0.2% of the star's mass would be an electromagnetic eruption made of ionized hydrogen (protons and electrons).

3. First support for the eruption hypothesis: our solar system.

The arguments for such an eruption lay in the extrapolation of the hypothesis of our planet systems' formation. In my paper "*Are Venus' and Uranus' Tilt of Natural Origin?*" I explain that the electromagnetic eruption of ionised hydrogen (in the form of protons and electrons) along magnetic paths that are external from the sun's surface, will make a spirally wound cloud along that magnetic path. The theory is proven to comply with the rotation velocity of Jupiter.
The hypothesis has been further developed in my paper "*The Titius-Bode Law Shows a Modified Proto-Gas-Planets' Sequence*" , wherein I discover that such a spirally wound cloud would perfectly fit with the actual distances of our gas-planets, if we consider that the proto-planet Neptune was originally located next proto-Jupiter, instead of next proto-Uranus. The correlation of the found sequence of the proto-planets versus the final and actual location of the planets is very high, because all other possible sequences of proto-planets totally fail. Moreover, the actual chemical composition of Neptune versus Jupiter does not contradict this hypothesis at all.

4. TrES-4 : a hollow cloud?

When I apply the eruption hypothesis to the exoplanet TrES-4, the planet would be a spirally wound cloud of protons and electrons, which each had another distance to the magnetic path, due to their different mass. The spirally wound cloud is then hollow, and inside the hollow sphere, the gravitation field is zero. The electric field is zero as well, if we consider either that the cloud's electrons were attracted again to the proton's cloud, either that the very light electrons are on the way to reach the much more heavy protons. In that way, the overall density of the cloud can be very low compared to its diameter. Due to the eruption of high temperature ionized hydrogen, the cloud is spinning about its axis. Due to these three effects, nor the gravitation field nor the electrical field will have much grip on making the cloud denser.

5. TrES-4 : a young planet?

If we give some credit to the eruption hypothesis, the distance of the exoplanet to its star is quite interesting. Since this distance is very short, and its orbital velocity high, I cannot but suggest that the exoplanet is not a very old planet, but rather only a proto-planet. I expect that the exoplanet's orbit radius will increase with time.
Indeed, the proto-planet will become more dense with time, just as Jupiter did. A supplementary argument of the large diameter of the exoplanet can be the high temperature of the cloud. But no data was available at the time of writing this paper.

6. Conclusion.

The electromagnetic stellar eruption hypothesis is a very promising explanation of the very low density of the exoplanet TrES-4. This explanation is supported by the excellent results of the solar eruption hypothesis, and by the corresponding nature of proto-planets created in this way.
The exoplanet is in that case rather a proto-planet and is expected not to come from a very ancient eruption.

7. References and interesting literature.

1. http://www.space.com/scienceastronomy/070806_largest_exoplanet.html

2. De Mees, T., General insights for the Maxwell Analogy for Gravitation.
Mercury's perihelion shift and the bending of light grazing the sun.
Solar-, planetary- and ring-system's dynamics.
Fast spinnings stars' and black holes' dynamics.
Spherical and disk galaxy's dynamics.