

Validation on the scenario of the formation of asteroid belt by deuterium fusion explosion of Jupiter-like planet

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A celestial body more than 1.3% of the mass of the Sun can begin temporary fusion of deuterium [1]. Gravitational potential energy of the center of this celestial body calculated under the constant density corresponds to the temperature on deuterium is about one million degrees (10^6K). The celestial body will blast when the amount of substances emitted from the celestial body by deuterium fusion is larger than the gas being sucked by gravity.

The planet for the validation is 13 times mass of Jupiter. Orbit of the model is the same with Ceres (the center of asteroid belt: $4.14 \times 10^8 \text{ km}$). Distances between planets and the Sun are as follows.

Neptune: 45.04, Uranus: 28.75, Saturn: 14.29, Jupiter: 7.78, planet (X): 4.14, Mars: 2.27, and Earth: 1.50. [in 10^8 km unit]. Gravitational field of each planet was calculated at the point of the same gravity with the Sun. Values are Neptune: 0.32, Uranus: 0.19, Saturn: 0.24, Jupiter: 0.24, planet (X): 0.81, Mars: 0.013, and Earth: 0.026 [in 10^8 km unit]. Planet (X) is located at a little outside of the snow line ($4.04 \times 10^8 \text{ km}$ [2]). Gravitational collapse is progressed in a short time due to existence of hydrogen gas about 100 times mass of dust. So, planet (X) became very large.

About 4.6 billion years ago, the Sun began the nuclear fusion. At that time, substances of solid core of the Sun were ejected into universe. Those had accelerated the growth of the planet (X). After that, the planet (X) began deuterium fusion. But, it was ended in an only blast. Most of fragments of planet (X) were emitted in the universe. Although debris that keeps the same orbital speed remains in the asteroid belt, the movement of gravitational center does not change due to elastic collision. Heavy bombardment of meteorites at 3.8 billion years before can be explained by deuterium fusion explosions of planet (X).

Further descriptions are presented at website: “ <https://youtu.be/QY8C7XK6k7I> ” ,
“ <https://youtu.be/fiMgXpUz2GQ> ” .

[References]

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