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Pashkuro N., Yalovik E.

Asteroid Mining

Belarusian National Technical University
Minsk, Belarus

Our planet is filled with useful minerals, but as technology develops, our requirements rise. As a matter of fact, scientists worked out plans of space development. Space objects contain large amounts of resources, which are in lack on the Earth. Space mining can be performed on comets, asteroids or other planets. Although because of our relatively primitive technologies, now it is impossible due to economic inefficiency. There are about 1500 asteroids that are as easy to reach as the Moon. Their orbits cross with the orbit of the Earth. These asteroids are convenient for such tasks because of their small gravity field. On the Earth heavy metals drowned deeper to the core when our planet was forming. On asteroids all minerals are distributed throughout the object. Thus, it is much easier to reach them. Asteroids can contain such rare minerals on the Earth, as nickel, Platinum Group Metals (PGM), gold, gems. Volumes of deposits on the Earth can barely be compared with such on asteroids. Asteroids can contain not only technical resources, but also substances, necessary for modern industry of food production such as phosphorus, antimony, nitrogen.

For now, asteroid mining stays extremely economically risky. Some analyses show us that cost of returning industrial amounts of asteroidal resources will be such high that it won't attract private investments. There are four possible techniques of asteroid mining:

1. In-space manufacturing;

2. Delivery of raw materials;
3. Processing and delivery of processed materials;
4. Transportation of whole asteroid to close and safe orbit around the Moon or Earth [1].

For all these operations special equipment is required. The first step is to get to the asteroid. Due to the lack of atmosphere in space it is easy to move, but there are much more problems with getting of the Earth. There is salvation in fuel modules that will refuel orbiting ships. When ship will approach asteroid, it will dock with it by a harpoon. All mining equipment need to be automated due to very long communication time. Space law involves several international treaties, along with national statutory laws. Most of the developed countries admit that space and space resources do not belong to anyone. So, it is to be resolved, how they will share resources between each other.

All the necessity of asteroid mining is to extract and transport to the Earth minerals that are in lack. By that we spend large amounts of financial resources on projects that aren't proven effective. I think that we need to postpone such program for «better days» and start to spend our planet resources rationally to avoid the Earth exhaustion [2].

References:

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