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Original Research Article

LET'S MEET THE APOPHIS

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Abstract

In 2029 asteroid Apophis will fly close to the Earth. This article analyzes the possible courses of action to prevent its collision with the Earth. The author suggests his own variant for solving this problem

Keywords: Asteroid, Apophis, Solar Reflector, Cable-stayed Field

Introduction

July 19, 2004 U.S. scientists Roy Tucker and David J. Tholen discovered a new asteroid, which rotates around the sun in an elongated orbit. Later this asteroid in honor of the ancient Egyptian god was named as "Apophis"[1]. By means of what features caught the attention of mankind this asteroid, which now is been mentioned more and more?

It turned out that this asteroid is "very not indifferent" to our Mother Earth, astronomers have calculated that in the future the asteroid's orbit will intersect the orbit of the Earth three times in the 21th century. Its next meeting with the Earth is expected at April 13, 2029, next meetings - in 2036 and 2068 respectively. According to updated data, the size of this asteroid is now about 340 meters across. If we consider that in April 2029 it will fly in close proximity to the Earth, it becomes quite clear why this asteroid cause concern of all astronomers of the globe.

Accurately estimate the minimum distance between the Earth and the asteroid in 2029 is not yet possible. We only know that this distance will be much smaller than the distance from Earth to the Moon. And what if in reality this asteroid will hit the Earth? The results of this disaster will be so grim as once upon a time, when a similar impact on Earth caused the glacial period and led to the extinction of the

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dinosaurs. Of course, mankind does not want to repeat the fate of the dinosaurs, so many scientists around the world urgently trying to find an effective solution to avoid a collision asteroid with the Earth.

To decline the asteroid away from Earth specialists offer a variety of solutions: cover the asteroid by white paint, wrap it in foil, divide it into small pieces, etc. However, I think that the most realistic way - decline the asteroid away from Earth using powerful thermal radiation directed to it. Experiments conducted in the laboratory have shown that if a powerful laser beam is directed to piece of rock, there will be a local overheating, and the rock will go into a gaseous state. This creates a powerful gas stream, which leads to a shift of the heated object in the opposite direction with respect to the heating zone side.

The question arises: Is it possible to create a sufficiently powerful laser beam to solve this unusual problem. It turned out that it is very doubtful. Instead of a laser beam, scientists have proposed to send to asteroid a concentrated stream of sunlight. Calculations show that the size of the reflector should be approximately 10 kilometers in diameter to create the luminous flux with the necessary power to heat a small area of the asteroid to two thousand degrees Celsius. To construct such a reflector in space was considered not feasible. Instead, it was proposed to launch into space about thirty small reflectors and create a system of their synchronization for their synchronous maneuvering and reflecting of light to direct solar energy onto a small area of the surface of the asteroid.

Can you imagine how difficult task is autonomous maneuvering and synchronization of all maneuvers for such a large number of free-flying reflectors? I believe that such a challenge would be simply impossible. And what to offer in return? Instead, I really propose to build in open space one huge solar reflector. Is it possible? If we follow the usual modern logic and will begin to create a frame of reflector from welded metal, it should be recognized as impossible.

My Solution.

I propose to create a huge reflector based on hard support contour, which after it's assembly will be braided with double cable network. As a result, we obtain a rigid three-dimensional object (Look Fig. 1).

For the construction of such object we will need stiff elastic straight elements and flexible cables, for example, of Kevlar or Vectran. Vectran - a modern composite material, the strength of which is double higher than that of Kevlar[2]. Examples of such structures can be seen in my extensive collection, which is housed in the "Space Architecture" chapter of English encyclopedia «Wikimedia Commons»[3].

Recently I posted at the internet my electronic presentation, entitled "Multi-storey space hotel"[4]. This presentation describes in details the creation of big space fields based on such cable-stayed networks. Namely the same technology I propose to apply for huge space reflector building to reflect solar energy and to concentrate it on the surface of Apophis.

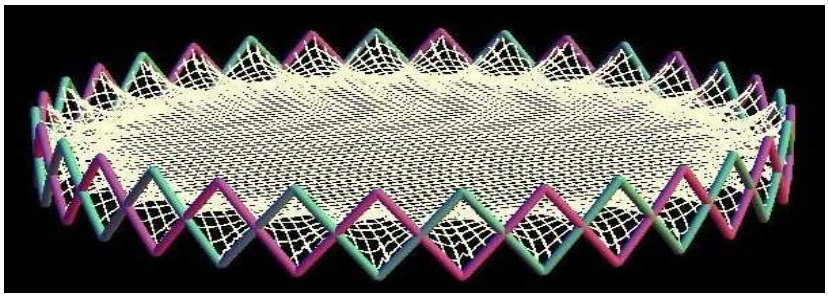

Fig. 1 – The supporting structure for the solar reflector

Ability to create in open space the huge cable-stayed fields is guaranteed with a special opened by me law. The essence of the law and examples of its application are described in detail in the article "Discovery in Statics"[5]. My article about the discovery in late 2013 published "World Journal of Mechanics", which before publishing checked my information within two months.

Footnote.

It remains to add that the project of protection the Earth from Apophis is a long, expensive and work-consuming undertaking. Before the Apophis arrival to the Earth left very little time. Time is short, the implementation described in this article project should have started the for a long time ago. Further delay in the starting of the project may lead to a huge disaster for our planet.

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