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**A METHOD FOR DEFENDING AGAINST LONG-PERIOD COMETS**

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**ABSTRACT**

A method of long-period comets deviation from the trajectory with Earth collision is described in the paper. It is based on the use of small asteroids targeted to a comet on a trajectory with high probability of Earth impact. It is assumed that the time for completing the required operations is strongly limited. With future systems like LSST, we are likely to find threatening long-period comets with only about two years before impact. To meet this demand we propose building a "shield" from small asteroids (or boulders taken from the surface of near Earth asteroids). These asteroids are selected from ones which are possible to transfer, by gravity assist maneuvers near Earth, into orbits resonant with the Earth. The most convenient but not mandatory resonance may be chosen as 1:1. The paper includes a description of the shield construction. The main constituents of appropriate operations are transfer of the spacecraft to the chosen asteroid, landing on its surface, capture of an acceptable boulder, take off from the surface of asteroid with boulder and fulfilling near Earth gravity assist maneuver. The concept is very similar to NASA's Asteroid Redirect Mission which, although it was cancelled, produced good studies showing the feasibility of the project. But rather than transferring the asteroid boulder to a lunar orbit, it instead would be targeted on a hyperbolic trajectory to a B-plane point to put it into a heliocentric orbit resonant with Earth. These operations are repeated for several asteroids so we receive around the Earth's orbit, a family of sky stones (with

sizes of about 5-7 meters) equipped by the control systems and rocket engines with possibilities to target them into approaching hazardous sky objects, such as long period comets or asteroids. The required flexibility is achieved by possessing a fleet of small asteroids in vicinity of the Earth's orbit having the necessary equipment to target them into dangerous celestial objects. It will be shown in the paper that it is feasible with the use of contemporary technology, including the use of a formation flying navigation method, to reach the required accuracy of dangerous object interception.

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