

ASTEROIDAL DAMAGE TO THE EARTH: IMPLICATIONS BY ASTEROIDS – RUBBLE PILES. G. A. Leikin and A. N. Sanovich, Sternberg State Astronomical Institute, Universitetsky Prosp. 13, Moscow 119892, Russia, E-mail:san@sai.msu.ru

In the case of asteroids – rubble piles its effective cross-section of collision to the Earth is determined not by consolidated body, but by cluster of its fragments. Since the stage of rubble – piles may be $\sim 10^8$ years (see our communication at previous symposium), it may be significant for estimation the asteroidal damage to the Earth.

If the total mass asteroid is M and the total number its fragments n (since by earth observations does not resolved asteroid image into individual fragments) in the case of optically thin cluster of fragments, the brightness of asteroid will be $\sim \sqrt[3]{n} L$ (L – the brightness of consolidated body of asteroid). The dynamical cross-section of asteroid will be also $\sqrt[3]{n}$ times as much.

Much more significant is that the suggested methods of asteroid control are based on imparting of kinetic energy to the asteroid for changing its orbit or destroying it. However the structure of asteroids – rubble piles may lead to the transfer of the kinetic energy from one to other asteroidal fragments and therefore to growth of the diameter of cluster, or to the destruction of one fragment and by enlargement of the number of fragments, also to the growth of asteroid cross-section.

It seems, that except the exploration the asteroids by cosmic vehicles the single method of revealing asteroids – rubble piles is the analyses of doppler's profiles reflected by asteroids radiosignales.