

27th IAA SYMPOSIUM ON SPACE AND SOCIETY (E5)
Space Assets and Disaster Management (4)

Author: Mr. Daniel Brack
Asher Space Research Institute, Technion, I.I.T., Israel, dbrack@tx.technion.ac.il

Dr. James Burke
The Planetary Society, United States, jdburke@caltech.edu

KINETIC INTERCEPTION STRATEGY FOR ASTEROID DEFLECTION USING DEFUNCT SPACE
ASSETS**Abstract**

Recent years have seen an increase in global efforts for potentially hazardous object collision avoidance and impact mitigation. These measures include detecting and tracking of near Earth objects in general and specifically potentially hazardous objects, formulation of disaster management procedures in case of impact and deflection mission propositions and studies. Two leading deflection strategies to-date are nuclear blast deflection and kinetic interception. Although the latter is limited in the size of potentially hazardous object deflected it is more viable given the political complexity of launching a nuclear device to space and seems to be suitable given the higher frequency of smaller potentially hazardous object impacts. The operational concept of kinetic interception is simply performing momentum transfer from the interceptor to the potentially hazardous object to sufficiently perturb the object's orbit and prevent its Earth collision. Two central interceptor characteristics that affect the magnitude of momentum transferred are the interceptor-object relative velocity and the interceptor mass. In this paper we propose an orbit ready kinetic interceptor system relevant for short warning time medium size (50-500 meter diameter) potentially hazardous objects. The interceptor utilizes geostationary orbit defunct assets as interceptor mass and thus reduces the mass-to-orbit launch requirements of the system. The paper then discusses the technical requirements and methods for asset collection, as well as legislation and financing required for this system.