

Exploration of Near Earth Asteroids (06)
Planetary Defense (3)

Author: Dr. Nahum Melamed

The Aerospace Corporation, United States, nahum.melamed@aero.org

Mr. Jason Anderson

The Aerospace Corporation, United States, Jason.P.Anderson@aero.org

Dr. Donald Yeomans

Jet Propulsion Laboratory - California Institute of Technology, United States,
donald.k.yeomans@jpl.nasa.gov

Dr. William Ailor

The Aerospace Corporation, United States, william.h.ailor@aero.org

WEB BASED MISSION DESIGN TOOL FOR PLANETARY DEFENSE FROM ASTEROIDS

Abstract

The Aerospace Corporation, in collaboration with NASA/JPL, is developing an interactive web-based Near Earth Object (NEO) deflection tool and a complementary handbook. The web tool will provide educational information explaining asteroid deflection issues, prompt users from the broader community to explore those issues, and help educate the public about the nature of the hazard. The web-tool will be accessible online which will contribute to public outreach and facilitate efforts to design and assess possible mitigation options. The method of kinetic impact has been selected for implementation in the web tool because it appears to be relatively robust and would be deployable on short notice with only moderate engineering development. It is likely to be the method of choice for mitigation of hazardous objects up to half a kilometer in size when there are years or more of warning time.

The NEO deflection tool design allows a user to vary mission parameters to deflect a simulated NEO expected to impact Earth. Current launch capabilities are used to bound mission inputs which produce attainable Earth miss distances consistent with the characteristics of a selected NEO. Users can vary the timing and number of missions to achieve a desired Earth miss distance. A Lambert solver determines the transfer arc from Earth to the NEO for user specified mission dates. Users will be able to impose other goals such as maximizing the time between intercept and predicted NEO impact on Earth. A working version of the tool will be demonstrated and available for trial use at the conference.