

18th IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND
DEVELOPMENT (D3)Systems and Infrastructures to Implement Sustainable Space Development and Settlement - Technologies
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China, sunqi5518@163.comA SPACE-BASED INTERCEPTOR MISSION DESIGN: PROSPECTS AND SIMULATION FOR
DEFENSE AGAINST NEAR-EARTH ASTEROID**Abstract**

In recent years, threat events about near-Earth asteroid have occurred frequently, and its defense issues have received widespread attention. We design a mission of near-Earth asteroid (NEA) defense based on approach of space-based interception which is one of the important means against small celestial body impacting the Earth. A conceptual space-based defense interceptor is normally orbiting the Earth and is launched for asteroid deflection in planetary threat situation. In this paper, the present situation and development trend of space-based NEA defense mission were comprehensive introduced and the feasibility of proposed mission design is reviewed. Some key technologies were deeply discussed and systematically summarized here, which include the role of radar in predicting, the orbit design of impacting small asteroids and evaluation model for asteroid deflection. Then, we present survey simulations for space-based mission to characterize impactor trajectory optimization which is consider as a key of the simulations. Intercepting orbit of interceptor launched at different orbit heights have been simulated by using Lambert algorithm and the characteristics of coplanar intercepting window have been depicted. The simulation shows that the intercepting window is wider if the increment of interceptor's maximum velocity is larger.