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- Impact Consequences
- Disaster Response
- Decision to Act
- Public Education & Communication

**Hybrid Constellation Design for Debris Removal and Asteroid Defense**

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**ABSTRACT**

*Dealing with the contradiction between rapid response and long-term in-orbit lifetime of the asteroid defense system, a debris removal & asteroid defense hybrid space laser constellation has been conducted. The constellation is constructed by multiple space laser platforms located in different orbits. When no asteroid threatening to the Earth, the constellation diversified to different orbits to remove the space debris, otherwise they bind together to form a laser array for required energy to defense the asteroid. In this paper, we analyzed the parameters of the constellation and calculated the payoff of the debris removal and asteroid defense. Procedures of debris removal and asteroid defense have also been simulated. The results indicated that the constellation has the ability not only to deflect the asteroid but also to remove space debris effectively.*

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