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EXPERIMENTAL STUDY ON MOMENTUM COUPLING LAW OF INTERACTION BETWEEN  
PULSE LASER AND ASTEROID LIKE MATERIAL

**Abstract**

There have been many asteroid impact events in the history of the earth, among which the most famous impact event led to the extinction of dinosaurs. Therefore, the asteroid impact event in the future will be a grave threat to the future sustainable development of human beings. In order to avoid the catastrophic consequences, it is critical to carry out the research of asteroid defense technology. The existing results show that the defending technology using laser ablation deflection has obvious advantages in dealing with small-scale asteroids with medium and long-term warning time. In this paper, the momentum coupling law of the interaction between pulse laser and asteroid like materials is studied by means of experiments. The momentum coupling characteristics of asteroid like materials irradiated by pulse laser are measured. The variation law of momentum coupling coefficient of asteroid like materials irradiated by different parameters of pulse laser is studied. The prediction model of momentum coupling coefficient of asteroid like materials irradiated by pulse laser is established. The results will be helpful to further reveal the mechanism of laser ablation of deflected asteroids.