

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Interactive Presentations (IP)

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DYNAMIC PROPERTIES STUDY AND OPTIMIZATION OF ASTRONAUTIC SEPARATION
PRODUCTS WITH DIFFERENT EXTENSION AND COMPRESSION STIFFNESS

Abstract

In order to increase the launching capability, the strap-on launch vehicle is widely adopted. In this type of vehicle, the structural design of the strap-on attachments is one of the most key techniques. Based on the typical strap-on launch vehicle, the mechanical property of the attachment is researched in this paper firstly, and the different axial stiffness in tension and compression character is revealed. Based on the research of the typical property, a single degree-of-freedom analytical schematic model is established and verified. Every design parameter that affects attachment's stiffness is researched based on this model. With this model, NSGA-II is used to optimize the structure of attachment, which can improve the mechanical property. This method can provide a reference and a basis for the attachment's structure design.