

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Space Structures I - Development and Verification (Space Vehicles and Components) (1)

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DYNAMIC ANALYSIS AND VALIDATION FOR ROTATING SEPARATION OF LM-5'S
LARGE-SCALE PAYLOAD FAIRING

Abstract

Separation strategy and structural design for payload fairing are key technologies during development of launch vehicle. In this paper, present strategy of fairing separation and simulation technique is reviewed. Then, rotating separation of LM-5's large-scale payload fairing is simulated through both multi-body dynamics and explicit structural dynamics, based on which, influence of elastic deformation and vibration responses on separation characteristic, enveloping space, and structural strength of the fairing are discussed. Furthermore, to estimate effects of atmosphere during separation experiment of the fairing, coupled Euler Lagrange method is employed. LM-5's fairing separation experiment results are introduced. Finally validity and accuracy for the analysis strategy are evaluated by the experiment results.